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# NetworkWorld

April 16, 2001 Volume 18, Number 16

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## SERVICES SNAFU?

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Dealing with ASPs, ISPs, Web hosts, long-distance and local providers can be downright confusing.



## Cisco to pack Web switching into Catalyst

BY PHIL HOCHMUTH

**SAN JOSE** — Cisco is readying a module for its Catalyst 6500 backbone switch that the company says can direct Web traffic and balance server loads faster than stand-alone Web switches.

The Content Switching Module (CSM), which Cisco plans to ship in a month, will cost two to 10 times as much as one of the company's stand-alone Web switches. See **Cisco**, page 16

# Companies warming up to PKI

BY ELLEN MESSMER

**SAN FRANCISCO** — Although public-key digital certificate systems remain expensive and hard to deploy, last week's RSA Security conference provided ample evidence the technology is winning over organizations.

In its presentation at the RSA Conference, Ford Motor said it has selected two public-key infrastructure (PKI) vendors, VeriSign and RSA Security, to allocate digital certificates to its 350,000 employees for signing and encrypting internal files.

"We came to the conclusion [we needed] to mandate a corporate policy to encrypt everything so we could secure all data," said Bob Brandt, a security technologist at Ford.

"We wanted dual partners to help ensure interoperability," added Paul Rathbun, also a member of Ford's security team.

Although virtually all vendors offer standardized X.509 digital certificates, getting these products to work reliably across Netscape and Microsoft browsers, VPNs, and certificate

authority and validation servers, remains dicey. This despite assurances from vendors that support for the Internet Engineering Task Force's PKIX standards solves interoperability problems.

Even as it embarks on a PKI strategy that will involve working with separate Ford divisions — and later trading partners — to promote end-to-end encryption for Web-based and proprietary business applications, Ford is wondering what the total cost of the effort will be.

"We need to recover the costs from business units, so we need to look at a cost-recovery model," Rathbun said.

See **PKI**, page 14

**The price of PKI**  
Gartner estimates that the cost of running public-key infrastructure software in-house drops from about \$150 per seat for 25,000 users to \$30 per seat for 200,000 users.

## Deciphering Microsoft's .Net puzzle

BY JOHN FONTANA

**REDMOND, WASH.** — Microsoft's .Net strategy is something akin to the old television game show "Concentration," which challenged viewers to decipher a phrase cleverly written in letters and hieroglyphics.

While Microsoft describes .Net as software that lives on the Internet instead of coming in shrink-wrapped packages, the year-old strategy still has IT executives scratching their heads as they try to figure out

what the slew of .Net marketing lingo, standards and products will mean to their enterprise networks.

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### BEYOND THE BUZZ

Read more about Microsoft's .Net initiative.

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" .Net is like a five-dimensional cube," says Peter Osbourne, group manager for advanced technology and decision support systems for Dollar Rent-A-Car. "I'm a mathematician and I know if you try to visualize that cube, you will never understand it. You need to look just at the pieces you can use."

In its basic form, .Net consists of development tools, server software and devices from PCs to phones that are smart enough to run applications locally or at the server (see story, page 75).

Also included is prebuilt code that can snap into other applications. For example, a prebuilt calculator program accessible over the Internet could be called into a mortgage or loan program running on another Web site.

Microsoft's Bill Gates said last June that .Net will affect every See **.Net**, page 75

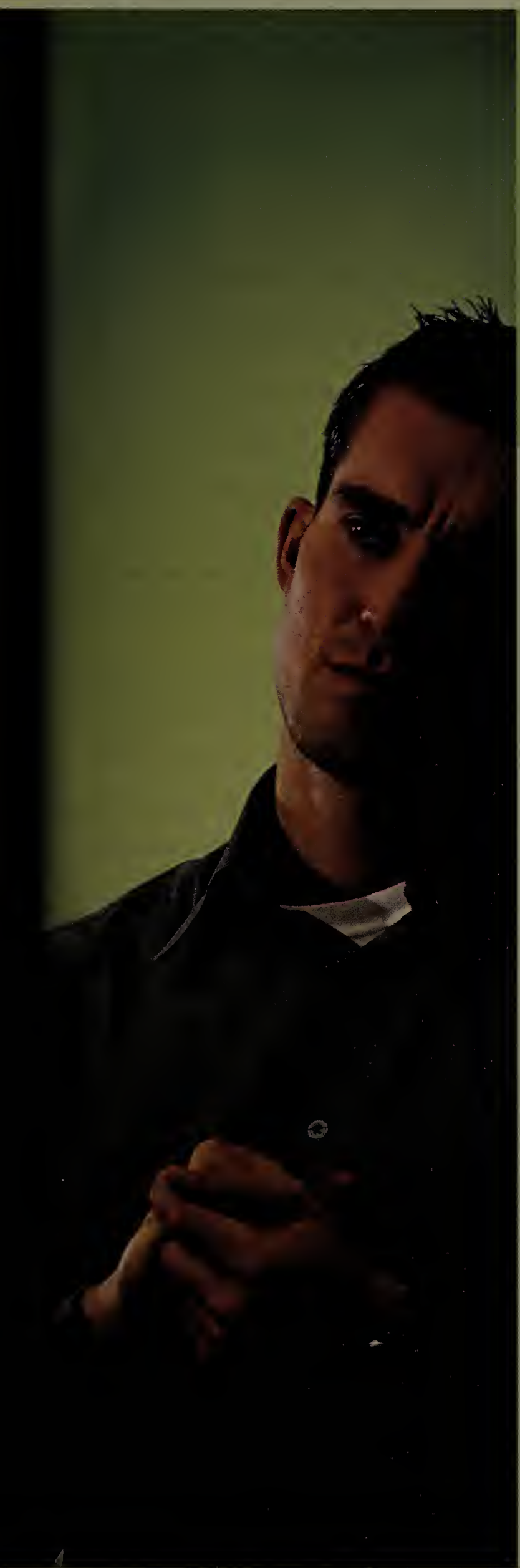
## Shopping for speed

**Pick the right Internet access speed for your teleworkers without blowing the budget.**

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Entrust's Brian O'Higgins discusses the future of PKI standards.

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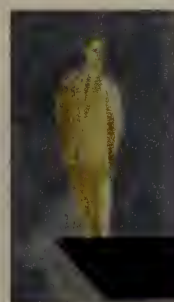
PictureTel's 600 series gives users more options.

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Riverstone's Romulus Pereira sees opportunity in MAN market.

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Relationship managers help corporations navigate technology.

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## Shopping for speed



How to select the right Internet access speed for your teleworkers without breaking the bank.

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## The trouble with trunking

We tested high-end Gigabit Ethernet switch/routers from Cisco, Extreme and Nortel, and found that only Cisco's Catalyst 6509 could handle complex link-aggregation functions without suffering a performance hit.

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## Management

**Key communicators:** The role of relationship manager is becoming vital for aligning business requirements with technology. **Page 60.**

**Editorial:** Here's a quiz: Can you name the top five ISPs? **Page 48.**

**Joel Snyder:** Make sure your PKI is up to the task. **Page 49.**

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CONTACT US Network World, 118 Turnpike Road, Southborough, MA 01772; Phone: (508) 460-3333; Fax: (508) 490-6438; E-mail: nwnnews@nww.com;

CIRCULATION: Phone: (508) 490-6444; Fax: (508) 490-6400; E-mail: nwcirc@nww.com; STAFF: See the masthead on page 18 for more contact information. REPRINTS: (717) 399-1900





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### INTERACTIVE

#### IPv6 audio primer

As more devices connect to the Internet, the need to expand beyond the 4.3 billion available IP addresses grows. IPv6, under development by the IETF, is designed to expand the number of IP addresses and create an easier system for managing network-connected devices. Learn how IPv6 works in our 8-minute audio primer. **DocFinder: 3836**

#### We want you

Who are you? What do you like to do in your spare time? We want to find out more about our readers for our annual You Issue. Fill out a short survey and maybe you'll be featured in the July 23 issue of *Network World*. **DocFinder: 3837**

### FORUMS

#### Keeping Current

Last week, columnist Fred McClimans said the Postal Service is doomed by e-mail. Who knew letter carriers read Fusion? Well, they do, and they give McClimans a piece of their mind. **DocFinder: 3838**

#### Typical Wi-Fi twaddle?

Do you agree with what others are saying about the battle for control of the small office/home office? Read opening statements and add your views. **DocFinder: 3839**

### NEWS

#### First quarter

Juniper Networks Chairman and CEO Scott Kriens is especially pleased about his company given the challenges of today's economy. Read why. **DocFinder: 3840**

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### CARUSO'S CACHE

The best of the NetFlash daily newsletter

#### Pioneer sends 10,000 customers virus-infected e-mail

Electronics vendor Pioneer inadvertently sent a virus to thousands of people registered to a company e-mail service. The upside is, apparently no one reads their Pioneer e-mail because the virus has affected only 19 of the 10,758 users on the list since the virus went out more than a month ago. Now I'm no marketer, but that sounds like a pretty lousy response rate — and I'll bet you even fewer people will read the e-mail next time. **DocFinder: 3860**

#### Authorities uncover global 'Net banking scam

Score one for the good guys. Investigators have shut down a scam where a group was selling fake stock over the Internet. The scam involved setting up fake Web sites and then pumping and dumping stock to boost prices. Authorities haven't charged anyone yet, but the money lost to the scam could be as much as \$3.9 billion, according to some estimates. And you wonder why the economy is in such bad shape. **DocFinder: 3861**

#### Internet use rises among blue-collar workers

The 'Net isn't just for people who read "Dilbert" anymore. Laborers and factory workers are the fastest growing population online. Homemakers are right behind them. Interestingly, most of these users are connecting over dial-up modems, not broadband — so it appears the "digital divide" is still there. **DocFinder: 3862**

#### Spec for real-time Java inches closer

The day of Java-enabled coffee makers is getting closer to reality (however redundant that may sound). By the end of the month, Sun hopes to have a preliminary spec ready for Java for embedded systems. These are systems that usually hide their workings from users, like control systems for cars, traffic signals or household appliances. **DocFinder: 3863**

— Jeff Caruso, managing editor, online news

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### COLUMNISTS

#### Compendium

*Ding dong, the clip is dead*

Fusion Executive Editor Adam Gaffin remarks that Clippy isn't really gone from Office XP. He's still there; it's just that now he's turned off by default. Thank God. **DocFinder: 3842**



#### Home Base

*Not cut out for the home office*

Net.Worker columnist Jeff Zbar writes the first in a two-part series on spotting the signs of potential telework failure. **DocFinder: 3843**

#### Help Desk

*Server problems*

Ron Nutter helps a user reinstall Service Pack 5 onto a Novell server. **DocFinder: 3844**



## NEWS BRIEFS, APRIL 16, 2001

**Healthcare privacy rules take effect**

Department of Health and Human Services Secretary Tommy Thompson last week decided to let the much-debated Health Insurance Portability and Accountability Act healthcare privacy rules formally take effect. The move came despite voluminous criticism he heard about the rules, which were issued by the Clinton administration, from hospitals, insurance companies and other parties during last month's round of written comments. Although he praised the HIPAA rules as beneficial to the privacy of patient data, Thompson also emphasized that HHS intends to alter the regulations and will issue "guidelines" on how the Bush Administration expects them to be implemented by the healthcare industry and its business partners.



Secretary Thompson says healthcare privacy rules will undergo changes.

Among the latter were company President Diana Whitehead, who held the job for only two months, and vice president of business development Mari Tangredi. "The last weeks have been difficult for Critical Path," said David Hayden, company founder and executive chairman, in a statement. "Now we have turned the corner with the implementation of a reorganization designed to reduce costs and focus the company on its core products." In February, Critical Path had to restate earnings after discovering problems with previously reported revenue.

**Network cancels NBC Internet**

NBC last week decided to shut down the NBC Internet portal in which it was a minority shareholder. In order to shut down Internet NBC and lay off many of its 300 workers, NBC will have to buy the portal for \$85 million in cash. NBC Internet suffered a net loss of \$245 million in the last quarter of 2000. Shares of NBC Internet, which stood at close to \$100 in January 2000, closed at \$2.14 last week. NBC owns other Web sites, including NBC.com and AccessHollywood.com, and assets of the NBC Internet portal may be combined with them.

**Kana, Broadbase circle wagons**

Two struggling start-ups in the customer relationship management arena, Kana Communications and Broadbase Software, last week agreed to merge in a stock-swap deal valued at \$40 million. The combined firm will be called Kana Software. Kana recently said it would lay off 20% of its workforce.

**Verizon split proposed in Virginia**

A group of competitive service providers, headed by AT&T, last week filed a petition with the Virginia State Corporation Commission asking it to order the state's incumbent carrier, Verizon, to separate its wholesale and retail units.

The group says splitting Verizon is the only way to ensure competitive providers get fair treatment from the company. Competitive carriers must work with Verizon, which owns the last-mile local loops, to offer telecom services to users. Similar attempts to split Verizon have been made in other states, including Pennsylvania and Maryland. Pennsylvania and Maryland declined to enforce the structural split of Verizon's wholesale and retail arms, although Pennsylvania said there should be a functional split.

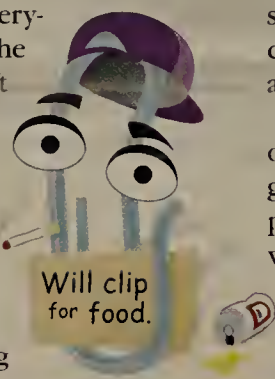
Verizon has responded to the petition by stating that a structural split would result in higher phone costs, longer deployment rollouts for new technologies and customer confusion.

**Smell technology whiffs failure**

Feel free to supply your own smart-alecky remark about this business failure: DigiScents, a developer of technology that is supposed to give computers the ability to create odors on demand, has apparently flunked the smell test in its attempts to find new investors. The Oakland, Calif., company, which garnered more attention than a skunk at a garden party when it launched two years ago, closed its doors last week after failing to replenish a \$20 million capital stake. "We're basically trying to position ourselves for a relaunch," said a DigiScents executive. Expect to see potential investors positioning themselves upwind.

**Say so long to 'Clippy'**

Anyone who has long been bugged by that paper-clip helper in Microsoft Office — in other words, almost everyone — can now vote on the icon's fate on a Microsoft Web site. Of course, none of the options involve melting the annoying Clippy down to a useless drop of tin. Microsoft is eliminating Clippy from Office XP, the forthcoming upgrade to the application suite. A special Web site devoted to Clippy's exit can be found at [www.officeclippy.com](http://www.officeclippy.com). Clippy's response: "At least I'm not a sock puppet."

**Pink slips fly at Critical Path**

E-mail outsourcer Critical Path last week announced the layoff of 450 employees, including seven from upper management.

# Network storage systems get a management boost

BY DENI CONNOR

**PALM DESERT, CALIF.** — IT professionals at Storage Networking World last week were introduced to a slew of software packages that could help them discover, map and monitor newly released IP storage devices, as well as legacy Fibre Channel gear.

More than 500 users and 1,700 vendors attended the show sponsored by the Storage Networking Industry Association (SNIA). Attendees also saw a coterie of vendors roll out software that took fresh approaches to controlling storage resources with an eye toward helping users address high-availability and growth issues. Analysts say companies should be on the lookout for better ways to manage storage resources given that the cost of managing storage typically exceeds the cost of the storage hardware by an 8-to-1 ratio.

At last week's show, BMC Software launched Patrol Application Storage Resource Manager (ASRM) software that maps and discovers storage devices on IP and Fibre Channel networks and correlates the data with application performance and availability information.

The goal of the BMC package is to relate storage assets to the database applications they host and monitor their availability and performance. For instance, if a customer runs an Oracle or Microsoft SQL Server database, database and storage administrators want to predict when RAID arrays or databases will fail and be alerted so that they can anticipate interruptions to database applications and quickly restore operations.

The package works by having the browser-based Patrol ASRM discover and map the location of host bus adapters, servers, switches, routers and disk drives on the network, and collect their attributes and event information. ASRM then generates a logical map of the network, showing the capacity and utilization of storage devices and the applications running on each volume of the disk drive. It then charts infor-

mation that tells the network or storage administrator when logical or physical problems may occur with the network or the applications running on it. ASRM is capable of predicting storage failures and forecasting how storage will grow as applications change.

BMC has developed modules for Network Appliance file servers, EMC Symmetrix arrays and Compaq StorageWorks devices. This fall the company will deliver Knowledge Modules for e-business applications such as those from Ariba, as well as for additional devices and databases. The company has developed Knowledge Modules for storage devices such as the Nishan Systems IP Storage switch and for Fibre Channel gear from Brocade, Crossroads and McData. The company also has modules for Oracle and Microsoft SQL Server databases. It is working on PeopleSoft and Baan application modules.

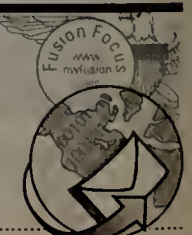
"[BMC's ASRM] doesn't just look at numbers and map physical devices like some packages do," says John Rector, a manager at the California Institute of Technology's Department of Astronomy in Pasadena, Calif. "[ASRM] marries the IP and Fibre Channel networks with applications and uses queuing theory and simulation to show the effect applications will have on storage and vice versa. It determines how everything will work optimally together."

Analysts say other vendors have traditionally discovered the physical and logical storage network. However, they have done little to correlate the two, says Carolyn DiCenzo, an analyst with Dataquest. "Since people design storage networks based on application, it's exciting to be able to join the two in a manage-

See **Storage**, page 9

## Storage

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## Storage, continued from page 8

ment package.

"At present, it is easier to manage the IP network than the Fibre Channel-based storage network because tools have long been available for managing IP," says Tom Clark, co-chairman of the Interoperability Committee for the SNIA. "Tools are just starting to be developed for managing Fibre Channel networks. The next wave of management utilities appearing will be those that let you blend the [IP and Ethernet] plumbing with storage resources, capacity, allocation and performance."

## More management wares

In other news at the show, storage resource management (SRM) vendor Astrum Software bolstered its StorCast software with a performance monitor. Called the Storage Performance Manager (SPM), it lets network professionals determine how system CPUs, disk I/O, memory and network resources are operating. SPM predicts failures before they occur and notifies administrators when monitored devices fall outside defined parameters. Intended to run on NT or Windows 2000 networks, SPM will ship this quarter.

Start-up TrelliSoft, another SRM vendor, introduced its first software package, StorageAlert, which monitors devices across NT and Unix networks. StorageAlert is suited for net professionals and notifies them of possible disk failures. It identifies and deletes old data that wastes space, audits data to make sure it is backed up, analyzes storage use and enforces individual user space quotas. StorageAlert is available now for \$1,000 per Intel processor.

Separately, StorageNetworks and StorageApps jazzed up their monitoring software for customers of their managed storage services.

StorageNetworks gives users an API to link their management frameworks to StorageNetworks' StorOS operating system. In addition, StorageNetworks enhanced its customer portal software, the Virtual Storage Portal, to include back-up configuration reporting, change management and improved SAN, tape and network-attached storage topology views.

StorageApps introduced SANMaster, software that targets enterprise network users, lets them monitor the

storage network and be warned of potential problems. SANMaster works with the company's SANLink storage appliance.

The products join a crowded SRM market, in which Sun/HighGround, Compaq and Veritas all compete. Gartner says SRM software sales will reach

\$1.7 billion by 2003.

## New boxes debut

As expected, Cisco used the show to air its SN 5420 Storage Router, a Fibre Channel to Gigabit Ethernet device that will let customers send storage data over an Ethernet (IP) network and avoid

installing more difficult, less familiar Fibre Channel networks (www.nwfusion.com; Doc-Finder: 3758).

Brocade unveiled its 128-port Silk-worm 12000, a Fibre Channel switch for large enterprise storage-area networks (SAN), and McData launched its 64-port ED-6064 Fibre Channel switch. ■

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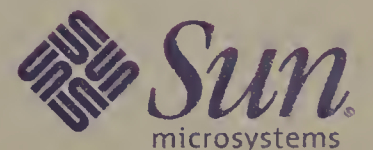
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## Correction

The story "No end seen for B2B troubles," (April 9, page 1) incorrectly identified Agile as a company that is laying off one-third of its workforce. The correct company is Ariba.



# Complex services make for complex choices

*With multiple providers teaming to deliver services, companies must be aware of the layers involved when trouble strikes.*

BY MICHAEL MARTIN,  
JENNIFER MEARS AND  
TIM GREENE

You pay a provider for a service, and that service provider delivers, right?

That's what David Taylor-Kraus, president of Atlanta Web design firm Digital Positions, thought until his Verio DSL Internet access went dead because of a line cut.

To get the problem fixed, his company would have to call Verio, and Verio would call NorthPoint, the DSL wholesaler that provided the DSL service to Verio. NorthPoint, in turn, would call BellSouth, which owned the line that had been cut. Each step through this multilayered service would take 12 to 24 hours, Taylor-Kraus feared.

In the past you may have had to deal with one or two providers — a local carrier and a long-distance carrier — for your network needs. But now the complex network services you buy can rely on four or five or more providers lurking in the background. And as companies put more of their business online and outsource support to application service providers (ASP) and Web hosts, the situation becomes even more complex, says Laurie McCabe, vice president and service director at Summit Strategies.

## Keeping tabs a challenge

"It's hard for one company to have all the expertise from Great Plains [business applications] back down to the DSL connection. That's a lot of ground to cover," she says.

The days of dealing directly with all your providers are numbered. Users must thoroughly investigate these services before they buy and aggressively pursue fixes when problems arise, experts say.

If Taylor-Kraus had it to do over again, he'd buy from a provider that owned all of the elements that made up the offering. "I would absolutely rather buy a service from the primary provider," he says. "They can

control the process."

In the end, Digital Positions called the third-party installer that put in the original DSL link. That third party coordinated the other providers to get the line back up and running within a day. If Digital Positions didn't have a close relationship with the installer, though, the outage would have lasted far longer, Taylor-Kraus says.

That was a year ago and was the only service interruption until last month, when the line went dead for good because NorthPoint went belly up,

Even so, having a multitiered vendor relationship isn't necessarily bad, some users say. "My take on it is, as long as it's working, I don't care how many people there are behind it," says Jeremy Thomas, a technical specialist with Macayo Restaurants in Arizona. While Macayo's 12 DSL lines are supplied by Rhythms, Thomas deals only with his ISP.

"I don't need to worry about Rhythms at all," Thomas says. "If a circuit goes down, I just call my ISP and everything's fine." And he likes the idea of one

are sensitive to them. Greg Falconer, director of dial and DSL products at Verio, says the NorthPoint situation is one of the most challenging he has faced, a "catastrophe." Within four hours of hearing about NorthPoint's impending demise, Verio notified customers and the next week urged them to switch to dial-up accounts that had been set up for them, T-1s or EarthLink DSL.

## Looking beyond legal obligations

Legally, Verio was off the hook for the SLAs it offered to customers on the DSL service backed by NorthPoint, because of a contract clause that voided the SLA if the DSL provider went out of business, bankrupt or terminated services. "We do recognize and understand the relationship we developed with these customers and did our best to provide services that we could control and guarantee," Falconer says.

Similarly, ACT.world, an ISP in Montgomery, Ala., was left in the lurch by DSL provider BlueStar, says Sabrina Norrell, a network administrator with ACT.world. When BlueStar announced it was pulling out of Montgomery, ACT.world arranged for another provider, ConnectSouth, to serve its DSL customers. But then ConnectSouth picked up and left before that migration was complete.

"When ConnectSouth left, of course our customers looked to us and asked us what we were doing," Norrell says. "Some of them were very irate. They look to the people who meet them face-to-face to follow up on their problems, and that is us. It's sometimes hard to explain we've done everything we can."

Michael Caspar, CTO at SirenServ, an online content provider, buys Web hosting services from Verio. SirenServ buys access to those services from SBC Communications, which in turn relies on UUNET for part of the access link. Sometimes when problems arise, SBC and UUNET point fingers at each other. He says in one instance, "after

screaming and hollering," he got through to a UUNET engineer who finally moved SirenServ's service off a broken router.

Caspar says he's happy with Verio's service, but he notes its data center and network operations are separate, even though they are part of the same company. That can slow problem resolution, he says.

Through all this complexity, Caspar stands behind the service he provides to his content customers. And when his providers drop the ball, he finds himself pointing fingers to explain why SirenServ's service has failed.

"The fact of the matter is that our site was down, and that's how they look at it. They just want the site back up. It's our reputation that ends up getting bruised in the eyes of our 300,000 users and 250 paying customers when something like that happens," Caspar says.

## Try to keep things simple

He recommends picking providers carefully. "It's a matter of doing your homework and trying to keep as few moving parts as possible," he says.

When times are good, providers prefer to keep customers unaware of the layers behind the service. E-Tunnels, which wholesales managed VPN services to ISPs, trains the help desks of the ISPs it serves, says Derek Ferguson, e-Tunnels' COO. "If they can't deal with a question, they put the customer on hold and the ISP calls our technical assistance center," Ferguson says.

But the goal is to give the service a single face. "Customers don't need to be aware of this back-end connection," he says.

But end users should be aware of what goes on behind the curtain, says Chris Richter, director of product marketing at Exodus. "They need to understand what comprises a service-level agreement and really understand how service is delivered, and not take things at face value," he says. ■

## Protect yourself

**Here are some tips for avoiding unexpected problems that can arise with services that require multiple vendors to work properly:**

- Ask upfront whether another provider is in the background supporting the service you are buying.
- Check out the vendors' track records for reliability.
- Understand what responsibilities vendors accept and where they draw the line.
- Demand SLAs that guarantee service quality, not just uptime.
- Have service providers demonstrate how specific problems will be handled.
- If the service is critical, buy a redundant service.

again demonstrating the vulnerability of such interdependent service offerings.

Paul Scheusler, network manager at Advanced Energy Systems, tried to avoid a problem like the one Digital Positions faced, but he was hit anyway.

He needed remote access DSL lines, so he went directly to Rhythms NetConnections, a national DSL provider. Scheusler figured that since Rhythms would own the service, the provider would be able to fix any problems directly. But Rhythms shuttled him off to an ISP called Intap that resold him the service set up by Rhythms.

Last month, when Scheusler's DSL-connected users could not connect to the Advanced Energy Systems network, he discovered Rhythms had pulled out of the region and taken its IP addresses with it. In the meantime, he has received new IP addresses from Intap and service has been restored.

"But I still don't know who my upstream service provider is now," Scheusler says.

point of contact and one service-level agreement (SLA) that covers the multiple providers, as does Andrew Feldman, a vice president at Riverstone Networks of Santa Clara.

Riverstone hosts applications and storage systems with Exodus. Feldman bought a metropolitan Ethernet link from Telseon to connect to Exodus' data center, and later Exodus packaged wholesale Ethernet access with its hosting and storage services. Feldman says he would rather have bought the access and service bundle because of the single point of contact and the single SLA, provided that the Exodus SLA withstood his scrutiny.

"There is a long history in the telco market of wholesaling and retailing what other people wholesale. So we wouldn't be concerned at all," Feldman says. "Now if Exodus showed itself unable to effectively deliver a solution, clearly that would be a problem."

Such problems are bad for business, and service providers



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# Genuity teetering, but signs of hope remain

BY DENISE PAPPALARDO

**BURLINGTON, MASS.** — Even with a stock price wobbling dangerously around \$2, Genuity's prospects appear stronger than those of its ailing competitors.

The prime reason Genuity has a better shot of pulling out of its tailspin is its relationship with Verizon. The incumbent local exchange carrier owns a portion of Genuity, which has slightly eased the fears of customers and financial analysts.

"Genuity was able to mitigate our concerns about its finances before we signed our contract," says David Blauer, CEO at Click4Care, a software company that develops Web applications for the health insurance industry. "I must admit when I saw the stock trading around a buck a share, it made me nervous. The fact that Verizon is investing in Genuity gives us a sense of comfort."

Click4Care, which is using Genuity's Black Rocket fully managed hosting service, knew it wanted to outsource its application and Web server management six months ago when it started shopping for a service provider. Click4Care chose Genuity because it was more responsive than Digex and offered a fully managed service that Exodus did not, Blauer says.

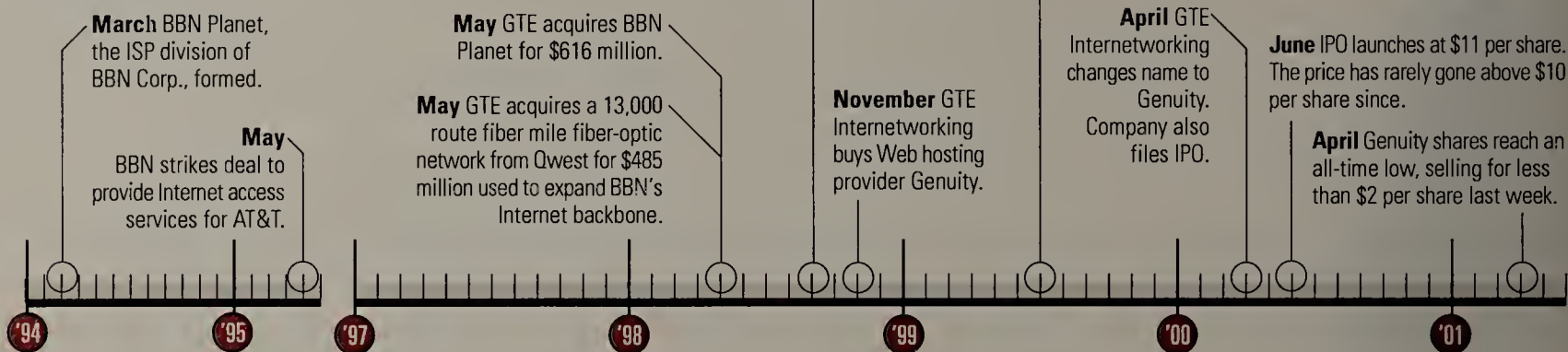
While Genuity's hosting services fit Click4Care's needs, the fact that Verizon owns 9.5% of Genuity with the option to increase its ownership to 82% also helped. That option can only be exercised after Verizon receives regulatory approval to offer long-distance voice service to 95% of its customers. For Verizon to offer this service, it must prove to regulators that it is fairly opening its local markets to competition.

Because that process is dawdling, with Verizon offering long-distance service in New York and Texas, Genuity may wait a long time for a full Verizon bailout. The optimistic view for Genuity is Verizon has ample motivation to make this work.

"The bottom line is that Genuity really is Verizon's entrance into long-haul data. Without it, Verizon would be starting from scratch," says Stephen Mahedy, a financial analyst at Salomon Smith Barney.

## The many faces of GENUITY

Here's a brief history of the ISP that's held three names in its eight-year history.



**July** Paul Gudonis becomes GTE Internetworking's president; George Conrades leaves the company.

**July** Bell Atlantic and GTE announce merger, forcing the joint company to divest GTE Internetworking, retaining 9.5% of the ISP.



Gudonis

There always remains an outside chance Verizon would not convert its shares to increase ownership, but that's clearly a remote possibility, he says.

Genuity has a nationwide fiber-optic network that's on a par with that of UUNET, the nation's leading ISP, says Steven Harris, an analyst at consulting firm IDC. Verizon clearly is not going to want to build its own network.

Despite the sagging stock price, Genuity remains better off than several competitors.

Genuity has little debt compared with PSINet, which is on the verge of bankruptcy. Genuity's only debt is a short-term \$500 million loan it took from Verizon earlier this year. PSINet is \$3.4 billion in the hole.

PSINet also made acquisitions that proved difficult to integrate into the core business, Mahedy says. "And for all of [PSINet's] capital expenditures that went toward building its network, the return on invested capital was never completely realized."

Genuity has also been known for its technical prowess.

"Genuity has been on the leading edge of network technology offering digital certificate authentication with its VPN services for a couple of years, where others are still in the planning stage," IDC's Harris says. "PSINet's network for the most part is still IP over frame relay."

Genuity can also tout enterprise customers such as McDonalds, Sears and Honeywell, as well as wholesale service provider customers such as AOL and Deutsche Telekom.

Genuity's biggest problem is it is still building its business.

The ISP plans to spend up to \$5 billion in the next few years to expand its IP capabilities. And Genuity will incur operating losses, which is taboo on Wall Street.

"Basically the company is not getting credit for forward [earnings] estimates," Mahedy

says. "In this environment the safe haven for investors is with companies that have lots of cash on hand, are generating free cash flow and have a long history of profitability."

Nevertheless, analysts believe Genuity will pull through.

"I'd be surprised if it became

another NorthPoint," Harris says.

Surviving the storm may not be enough for customers, of course.

"We have a one-year contract with them," says Click4Care's Blauer. "If we're not satisfied we'll go right to Exodus." ■

## Vendors bolster XML integration tools

BY JOHN COX

**NEW YORK** — New tools for XML-based data integration and application development took center stage at last week's XML DevCon conference.

X-Aware unveiled Version 2.0 of Avantio, which has been billed as a "virtual" XML database. Avantio stores no data, but rather acts as an XML overlay on data residing in back-end databases such as Oracle and Sybase, and through third-party software, with mainframe databases and enterprise applications such as SAP and Siebel.

A data administrator uses Avantio's new graphical interface to identify back-end database rows and columns from different databases, which can be dragged and dropped into an XML template. When a client application that can send or receive XML requests the data, Avantio uses what X-Aware calls "connectors" to access the target database. The requested data is formatted according to the template's guidelines and returned to the application.

"We are an additional software layer," acknowledges

Kirstan Vandersluis, CTO at X-Aware, of Colorado Springs. "But we perform very well. On a 700-MHz-based server, we can do over 2,000 Oracle [database] inserts per second. That's a lot."

The new version includes a complete graphical tool set, new connectors to support FTP and HTTP, and an interface to access custom data sources. X-Aware is creating an Enterprise JavaBean that will let Java components on a Java application server, such as BEA WebLogic, call Avantio, which can then access the data sources on their behalf. Developers can use a set of X-Aware Java class libraries to build an interface to Avantio.

Available now, Avantio 2.0 runs on Windows NT and 2000. Pricing starts at about \$10,000 for all elements and connections to four data sources.

Also shown at XML DevCon:

• InfoShark of Chantilly, Va., announced XMLShark 3.1, which uses XML to exchange data among a range of popular third-party databases. New features include single-keystroke replication of databases; an HTML interface that lets users

view subsets of data sources with Internet Explorer and then save data to an Excel or HTML file; and the capability to move objects such as diagrams as attachments.

• Data Access Technologies unveiled Component-X, a set of XML-based graphical tools, ready-to-use components for building Web services, and adapters to connect with a range of middleware software products. The development environment supports emerging protocols such as Simple Object Access Protocol and ebXML, as well as component models such as Microsoft .Net, J2EE and Common Object Request Broker Architecture. Component-X components are based on the ebXML component model, which is a standard for complex electronic business data exchanges. They use XML to interconnect with each other. ■

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PKI,  
continued from page 1

### Pricing PKI

But figuring out PKI costs involves a complex equation, according to Brad Hildreth, a Gartner research director. An organization embarking on PKI has to figure in much more than just each vendor's stated software prices, based on per-seat charges and amortizing them over five years or so. PKI vendors — there are about a dozen offering full certificate authority software and tool kits — sometimes charge based on the number of applications you want to PKI-enable, Hildreth noted during his talk at the RSA Conference.

"You may typically have two certificates per person, and you want encryption key recovery because people leave an organization and because 20% of users over five years forget their passwords for using their certificates," Hildreth said.

Companies should also have two certificate authorities — systems that issue digital certificates — in case one has problems, he said.

Other costs include hardware, the time of corporate lawyers involved in approving a licensing contract and vendor software maintenance fees. In addition, companies may need to pay for training users and technical staff, which could include help-desk personnel and people to validate users' identities before giving them certificates. Smart cards and readers will also be required if digital certificates are to be stored

using such technology.

In all, Gartner estimates that deploying PKI as software managed in-house typically costs \$150 to \$180 per user for 5,000 to 25,000 seats. But that drops sharply for higher volumes, to an estimated \$40 per user for 100,000 seats and \$30 per user for 200,000 seats.

To outsource PKI as a service from VeriSign or another such company costs roughly the same up to between 30,000 and 80,000 seats. Beyond that number of seats, it's less expensive to run the PKI system in-house, Hildreth said.

"If this is strategic, you may want to insource it. But if you trust VeriSign's people more than your own, you may want to outsource it," he concluded.

### Michigan buys in

The State of Michigan's Department of the Treasury this month is finishing up a 265-seat PKI deployment of RSA's Keon client and server software, which stores keys and certificates and can be used with many applications.

"The transition was traumatic," said Stanley Borawski, an administrator at the Treasury Department in Lansing. The Treasury made the leap from a non-networked environment based on paper, fax and phone, to a LAN-connected office with field auditors equipped with PCs and digital certificates for signing and encrypting all documents. The RSA Keon software constitutes "a complex product, and a sensitive one, especially with unsophisticated users," he added.

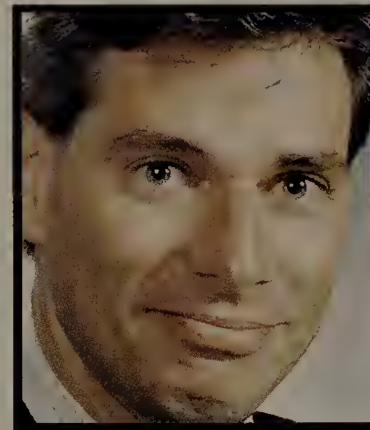
## WANTED: PKI INTEROPERABILITY

Server-based certificates are in wide use on the Web to verify that servers are truly what they claim to be.

But adoption of digital certificates by organizations for widespread e-commerce use remains clouded for several reasons, including a lack of interoperability among vendors' public-key infrastructure (PKI) offerings.

In an effort to address interoperability concerns, several vendors — including VeriSign, Microsoft, IBM, WebMethods, Entrust Technologies, Baltimore and Hewlett-Packard — last week announced plans to support a new XML-based key-management specification dubbed XKMS.

Different vendors' PKI software for certificates, certificate authorities and valida-



**"XKMS for Web-based PKI is probably two years out."**

Brian O'Higgins, chief technology officer, Entrust

tion servers built to the XKMS specification would, in theory, have no difficulty exchanging and validating

certificates across hosted Web-based PKI services.

That has yet to be proven, though, and will require many XKMS product "bake-offs" to ensure interoperability, said Brian O'Higgins, Entrust's CTO, last week at the RSA Conference in San Francisco.

"XKMS is now on a standards track at the Worldwide Web Consortium," O'Higgins said.

Completion of the XKMS standard suite and the interoperable products based on it are probably two years out, O'Higgins said.

But vendors are already showcasing XKMS prototypes on their Web sites. Entrust, for example, has posted at its site what it calls an XKMS "Web services responder."

— Ellen Messmer

noted there was customization required to use the RSA Keon product.

"They all busted their butts for us," he said, adding that Michigan is now looking at having its citizens use Web-

based certificates in e-commerce transactions with the government in the future. ■

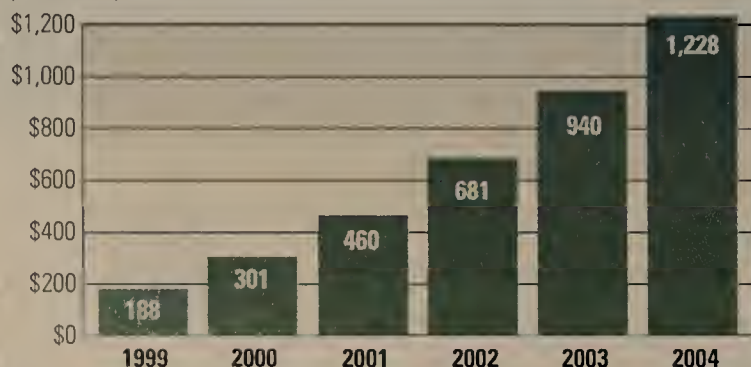
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### PKI gains popularity

Use of PKI has made gradual increases each year.

Worldwide public-key infrastructure product software revenue (in millions)



Note: The above figures don't include vendor revenues for certificate authority services, which reached an estimated \$204 million last year.

SOURCE: IDC

## FTP has security holes

BY MARGRET JOHNSTON

PGP Security's Computer Vulnerability Emergency Response Team has notified three vendors that new vulnerabilities have been discovered in their FTP server software.

The security holes could let a hacker break into the servers, steal data, deface Web sites or substitute false data for information a company provides to its customers, according to PGP Security, a Network Associates business unit.

COVERT is not aware of any serious failures attributed to the vulnerabilities, but as news of the security hole spreads, "it's kind of a race to see if vendors can patch their systems before they are exploited by the bad guys," says Jim Magdych,

manager of COVERT's lab.

The problem was discovered in Unix systems from Sun, Silicon Graphics Inc. (SGI) and Hewlett-Packard. PGP Security is working with these vendors so they can provide patches.

Sun has verified that the security hole exists in its Solaris operating system and is preparing a software patch. HP and SGI are attempting to confirm that vulnerabilities exist in their offerings.

The notification about the FTP vulnerability follows COVERT's warning in January of a possible vulnerability in the software used in most DNS servers.

Johnston is a correspondent with IDG News Service's Washington, D.C. bureau.



A close-up photograph of a woman's face, focusing on her eyes and lips. The top half of the image shows her eyes looking directly at the camera, with dark, well-defined eyebrows and long, dark eyelashes. The bottom half shows her lips, which are painted with a dark, glossy lipstick. The background is dark and out of focus.

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# Software primes Web data for use with many clients

BY JOHN COX

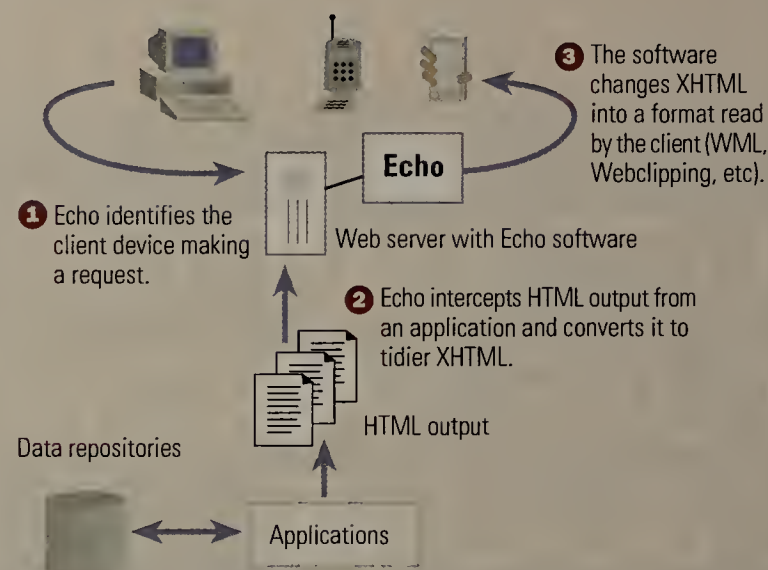
SAN DIEGO — New server software from Wireless Knowledge could greatly simplify the work of transforming Web information for use with the burgeoning number of handheld client devices in corporations.

The firm's Echo software acts as a data transformation program that takes the HTML generated by a Web application and quickly changes it into a format that the requesting smart phone, laptop or PDA can display. Echo eliminates the need to constantly update Web applications or use proprietary markup languages, the approaches favored by rival products, the company says.

To use Echo, customers load it on a Web server, initially Microsoft Internet Information Server (IIS) running on Windows NT or 2000. Echo's software's graphical user interface elements plug into the Micro-

## Speaking their language

Wireless Knowledge's Echo software, which runs on a Web server, is designed to minimize Web site maintenance by making applications accessible to a variety of client devices.



soft Management Console, which is a GUI to manage IIS.

The Echo code reads an

incoming Web request and identifies the requesting device (see graphic). The request is

passed on to the Web application, which generates an HTML page, or several, in responding. Echo grabs the HTML stream and converts it into XHTML, the next iteration of the markup language from the World Wide Web Consortium.

"HTML is messy, untidy," says Cullen Childress, product manager with Wireless Knowledge. "XHTML is very, very well-formed HTML. It cleans up this messiness into a much more well-formed state."

Next, Echo analyzes the document to identify its elements and the relationships among them. It uses this detail to figure out what elements to present to the client device. Finally, Echo selects the appropriate eXtensible Stylesheet Language (XSL) stylesheet, which can be thought of as a display guideline for a particular device, such as a Nokia Wireless Application Protocol cell phone or a Palm V handheld. Finally, Echo converts

the XHTML into the format that the device uses.

By focusing on an application's HTML output, Wireless Knowledge avoided several pitfalls. For one, it eliminates the need to constantly make adjustments to the transformation code each time changes are made to Web pages or the site. With Echo, the Web changes become part of the HTML stream that the software analyzes and converts automatically.

Second, Echo eliminates the use of separate development tools and proprietary markup languages.

But Echo doesn't substitute for bad application design. "You can't pipe something like MyYahoo through Echo and get something worthwhile," Childress says. "The developer has to keep [the requirements] of the mobile user in mind."

Wireless Knowledge: [www.wirelessknowledge.com/products/echo/](http://www.wirelessknowledge.com/products/echo/)

Cisco,  
continued from page 1

switches. But it also will deliver content switching across three times as many Gigabit ports as Cisco's top content switch, and is simpler to manage.

The module for Cisco's data center switch, which is aimed at enterprise networks and Web content or application hosting provider nets, will become the latest weapon in Cisco's arsenal of Web acceleration products. Cisco spent close to \$7 billion last year assembling a line of products aimed at speeding the delivery of Web content across IP nets.

The CSM will examine packets at the transport and application layers — Layer 4 and Layer 7 — to determine the destination port and URL information. Extracting port destination information will allow the switch to forward packets to the most available server, while application switching will allow packets to be shuttled to the proper server based on the Web site being requested.

The module could be used to provide Web switching and load-balancing services across all or some of a Catalyst 6500's ports. The 6500 could be con-

figured with as many as 384 Fast Ethernet ports, 130 Gigabit Ethernet ports or a mix.

The new blade will provide in hardware the same Layer 4 switching capabilities supported in the IOS Server Load Balancing software already available for the Catalyst 6000 family. But the CSM is "an order of magnitude" faster in that it has a 4G bit/sec access path to the switch's backplane, according to Seth Redmore, a Cisco marketing manager. The module is much faster than standalone Web switches and load balancers, Cisco says, because those devices need to access the Catalyst via a 1G bit/sec or slower link.

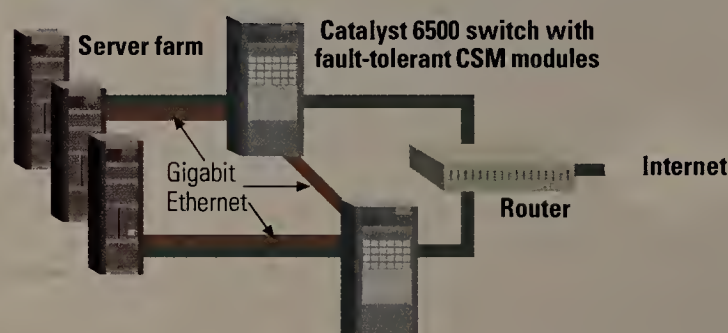
"Having access to the backplane is important, because that means [Web traffic] can get to other cards in the chassis with very high bandwidth," Redmore says.

The module also outperforms the IOS load-balancing software in that it performs Layer 7 switching and the software doesn't.

Redmore adds that CSM will allow users to free up Catalyst 6500 Gigabit Ethernet ports — which can cost more than \$1,000 apiece — that would have been occupied by exter-

## Sharing the load

Redundant Cisco Catalyst 6500 switches could be deployed with Content Switching Modules (CSM) for high-availability Web and application servers.



nal Web switch connections.

With every Catalyst port turned on for Web switching, the CSM could support a maximum of 16,384 servers.

Cisco entered the Layer 4-Layer 7 switch market almost a year ago, when it acquired ArrowPoint for \$5.7 billion. Cisco has since issued its own line of Layer 4-Layer 7 boxes — the Content Service Switch (CSS) 11000 series — based on the ArrowPoint technology.

"It would be delusional for me to say that [the CSM] does not cut into the CSS" in terms of product functionality, Redmore says. However, he adds that "the [CSM] does not take the place of the CSS 11000

series of content switches."

Businesses that need to sort out Web traffic based on application and URL information would be more inclined to buy an external Web switch, like the CSS 11800, Redmore says. Cisco's CSS boxes provide features the CSM cannot, such as the ability to handle surges in requests for Web pages. The CSS 11000s also work better with Web caching devices.

One analyst thinks the introduction of the CSM might send users mixed messages about the best way to do content switching and load balancing.

"They're positioning it to coexist with the CSS line," says Joel Conover, an analyst with

Current Analysis. "But it's quite a bit faster than the CSS — which is amusing because the CSS was supposed to be their lead product in the content switching space."

Price could be another consideration: The CSM will cost \$70,000, compared with pricing between \$7,000 and \$30,000 for the CSS products.

Cisco's Catalyst 6000 family competes with Layer 3 switches from Extreme Networks, Foundry Networks, Enterasys Networks and Nortel. Foundry and Nortel offer Web switches, while Extreme recently purchased WebStacks, a maker of Web switch technology.

Of Cisco's competitors, Nortel's Alteon 780 Content Switch comes closest to a CSM-enabled Catalyst 6500 in terms of combining Layer 4-Layer 7 switching and port density (336 Fast Ethernet Ports and 60 Gigabit Ports). The Alteon 780 surpasses Cisco with support for 2.4 million concurrent TCP connections, compared with the CSM's limit of one million. ■

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# Chinese start-up enters U.S. VPN game

BY TIM GREENE

**SAN JOSE** — ServGate Technologies, a VPN start-up with roots in China's elite Tsinghua University, will make its U.S. debut at NetWorld+Interop next month with a firewall/VPN gateway that would rank near the top of the field.

The company's crown jewel is the SG2000, a box designed to perform VPN processing and firewalling at full gigabit speed to protect busy data centers accessed over Gigabit Ethernet links.

Until recently, firewalls and VPN gear were in danger of becoming the bottlenecks in secure access to data centers because they could not keep up with the speed of Gigabit Ethernet LANs and Gigabit Ethernet WAN services.

## PROFILE: SERVGATE

<b>Location:</b>	San Jose
<b>Founded:</b>	1999
<b>Product:</b>	ServGate firewall/VPN gateways.
<b>Management:</b>	Jun Li, manager of engineering and co-founder; Charles Shao, manager of manufacturing and co-founder; Rick Schaffzin, president.
<b>Financing:</b>	\$4 million from Trident, Tsinghua Enterprises, Liu International, W.I. Harper.
<b>Employees:</b>	37
<b>Competitor:</b>	Cisco (PIX Firewall), Check Point, NetScreen.
<b>Fun fact:</b>	The company claims its engineering table tennis team is the best in Silicon Valley.

Only a handful of companies, such as Asita, Cisco and NetScreen, sell firewall gear that runs that fast. Check Point Software is revamping its firewall and VPN

software to accommodate gigabit connections.

ServGate says it is building a wire-speed, full-duplex device that achieves gigabit throughput when fully loaded. The com-

pany claims it has tested the firewall using small, 64-byte packets, which stresses the device more than larger packets would because more come through per second. The VPN has not been tested, but relies on chips being made by Broadcom to support gigabit throughput for IP Security, Triple-DES encrypted VPN traffic, says Dave Buchanan, ServGate's vice president of marketing.

A single SG2000 can be segmented into virtual gateways that provide up to 500 users with what appear to be private firewalls and VPNs. This would let the box support departmental security within a large corporation or keep distinct the VPN policies applied to business partners sharing a VPN. This compartmentalizing also would support multiple customers of a service provider if the device were placed in a high-rise office building, Buchanan says. Individual security administrators would be able to access, set and change VPN and firewall policies for their users.

The SG2000 includes virus scanning from Symmantec, denial-of-service attack prevention designed by ServGate, and intrusion detection from an undisclosed third party.

ServGate was founded by Jun Li and Charles Shao, who are affiliated with Tsinghua University in Beijing, one of China's most respected technical schools. Li is manager of engineering and Shao is manager of manufacturing for ServGate. The company is partially backed by an entrepreneurial arm of the university called Tsinghua Enterprises.

So far its other products include the SG200, a 10M bit/sec firewall/VPN appliance for creating site-to-site VPNs; and the SG300, a 100M bit/sec throughput firewall/VPN gateway. The SG200 costs \$2,000 and the SG300 costs \$7,000.

The SG2000 firewall goes into beta tests next month and ships in the third quarter. The VPN is expected to ship in the fourth quarter. The box costs \$60,000 to \$90,000 depending on the number of virtual gateways it supports and whether it includes VPN capabilities.

ServGate: [www.servgate.com](http://www.servgate.com)

# Jamcracker and Loudcloud team up

BY JENNIFER MEARS

**CUPERTINO, CALIF** — Jamcracker, which integrates hosted applications, and Loudcloud, an infrastructure service provider, have teamed to give enterprise customers easy access to hosted applications and managed Web-based IT services.

The joint marketing agreement, announced last week,

should simplify outsourcing internal applications and day-to-day Internet functions, the companies say. With the partnership, the two companies can offer a broader range of Web-based IT services and products. But, while Jamcracker customers may be pointed to Loudcloud and vice versa, customers will receive a separate contract and service-level agreement from each company.

Loudcloud's Scott Dunlap, vice president of marketing at Sunnyvale, Calif., company, says the two service providers found they were targeting the same customers, with Loudcloud peddling its back-end infrastructure support and Jamcracker selling hosted applications.

Loudcloud manages IT infrastructure using its Opsware automation technology, which lets it grow Internet systems and charge customers on a pay-per-use basis. Jamcracker is a so-called application service provider (ASP) integrator, meaning it doesn't host applications but manages a number of ASPs and acts as the conduit to deliver multiple services.

Carrie Lewis, an analyst at The Yankee Group, says the alliance will help both companies. Loudcloud customers

probably will be more likely to outsource applications to an ASP such as Jamcracker because they already are outsourcing infrastructure, while Jamcracker will send customers and ASPs Loudcloud's way.

Lewis anticipates seeing more partnerships at Loudcloud, which announced a marketing alliance with Accenture (formerly Andersen Consulting) last week, as the company looks to broaden its services.

Loudcloud, founded by former Netscape executive Marc Andreessen, recently reported fourth quarter revenue of \$8.9 million, a 94% increase over the previous quarter. But fourth quarter losses were \$58.8 million, and its stock has dropped more than 20% since its IPO last month.

Meanwhile, Jamcracker is continuing to focus on larger customers and plans to use resellers such as Loudcloud and partner Accenture to offer companies broader services. ■

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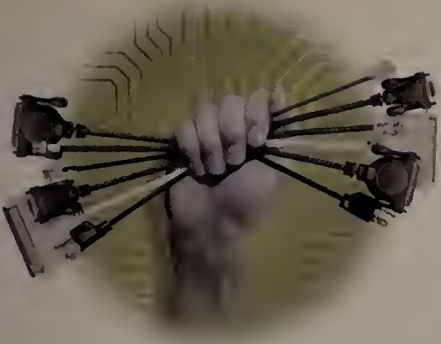
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## Briefs

Dell last week announced that its storage-area network (SAN) would work with a number of non-Dell servers. Dell expanded the capabilities of its PowerVault SAN to support IBM xSeries, Hewlett-Packard Netervers and Compaq ProLiant servers running Windows NT and 2000, and Dell PowerEdge servers. The PowerVault SAN includes servers, Fibre Channel switches and storage devices, as well as a configuration tool. The PowerVault SAN is available in bundles: the Power User SAN Bundle, the Power Business SAN Bundle and the Power Enterprise SAN Bundle. The Power Enterprise Bundle includes support for as many as six servers and up to 800G bytes of data.

Dell: [www.dell.com](http://www.dell.com)

Netgear recently announced a new family of 802.11b wireless Ethernet products, including the ME102 Wireless access point, the MA401 network adapter for notebooks and the MA301 adapter for desktops. The products are aimed at letting users install 11M bit/sec wireless LAN technology in small to midsize offices at a low price. The laptop and PC adapters cost \$180 and \$61, respectively, and the access point costs \$355. All are available now.

Netgear: [www.netgear.com](http://www.netgear.com)

Motorola last week said it would begin assisting OEMs with embedding Bluetooth wireless capabilities in products such as PCs, printers and copiers. Bluetooth uses low-power radio signals to exchange digital voice and data across short distances. Computer Group, a business unit of Motorola, will let the embedded Bluetooth technology run on Linux, VxWorks by Wind River Systems and Microsoft's Windows 2000, and on Apple PowerPCs and Intel processors.

Motorola: [www.mot.com](http://www.mot.com)

## Net Appliance offers content delivery

BY JASON MESERVE

Enterprise users looking to push files closer to end users have a new option for building their own caching system with Network Appliance's Enterprise Content Delivery Network (CDN) initiative.

Launching this week, the plan is to bundle Network Appliance's NetCache and Filer products with enhanced management software that can be used to build an internal CDN similar to those offered by service providers such as Akamai.

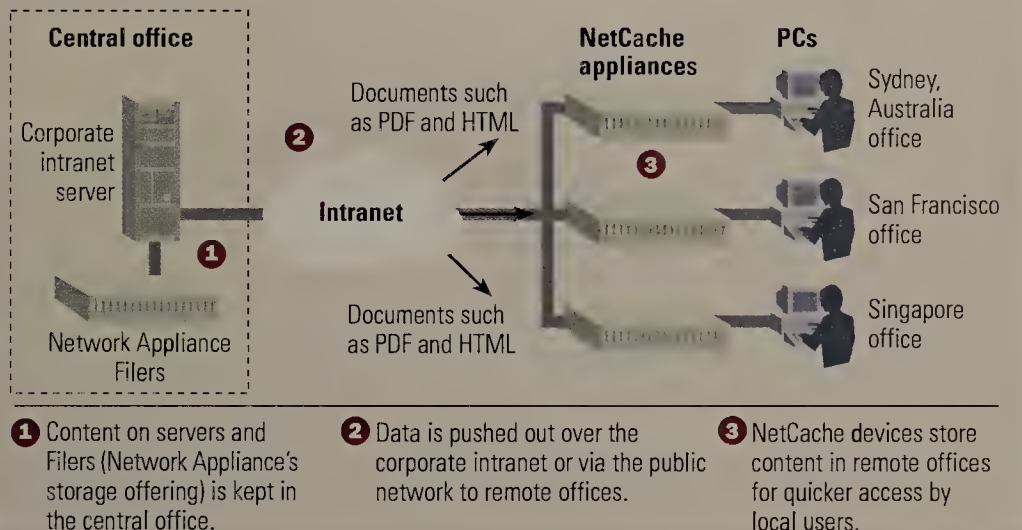
Files, documents and streaming media stored on servers and Network Appliance Filers (large storage devices) at corporate offices are pushed to NetCaches in remote offices for easier retrieval and use by local users. This saves time and traffic on WAN links because all files are retrieved on the LAN.

As part of its enterprise strategy, the firm is releasing Version 5.1 of its NetCache appliance software and Content Director 2.0, which is used for managing the CDN.

Content Director 2.0 features new controls for setting caps on the amount of bandwidth used for pushing content to and serving content from NetCache devices. Distribution encryption using

### It's all in the delivery

Network Appliance's new product bundle creates a content delivery network for corporate users.



Secure Sockets Layer is available through a partnership with cryptography company Widevine Technologies of Seattle. Network Appliance has also added compression technologies to save bandwidth.

Content Director also lets companies generate reports on how content pushed to the edge is being used. "This lets companies see if their distribution policies are

actually working," says Steve Duplessie, a senior analyst at Enterprise Storage Group.

With NetCache, support for IP Multicast has been added, and the streaming media proxy is now endorsed by RealNetworks.

Prices start at \$50,000 for a package with one top-end Filer and 10 NetCaches.

Network Appliance: [www.netapp.com](http://www.netapp.com)

## PictureTel slims down videoconferencing unit

BY JOHN FONTANA

IT executives searching for videoconferencing systems for the boardroom to the desktop will get a few more room-based options this week from PictureTel.

The company is adding the PictureTel 600 Series to its line of iPower videoconferencing units and introducing the second version of the PictureTel 900.

The iPower line is designed to give IT executives enhanced video, audio and data sharing, a built-in PC and varying price options for room-based videoconferencing. The 600 Series is a small appliance-like device with some of the features of the more sophisticated 900 series.

"We call it the 900 light," says Chris DiFiglia, vice president of IT for Bear Stearns Companies. "We're looking at it to bring videoconferencing and data collaboration to our power users, our executives and managers."

DiFiglia says he can easily set up the



PictureTel's 600 series videoconferencing unit lets users separate the camera and microphone from the base unit.

600 Series units as a cost-effective option for individual offices. Bear Stearns, which provides financial services for governments, corporations, institutions and individuals worldwide, is building a 46-story headquarters in New York with 15 rooms dedicated to videoconferencing.

"The 600 gives us a couple of different flavors, and that's what we need," DiFiglia says.

He says the most important feature of the iPower line is the image-sharing

capabilities, which let users inject images from remote computers into the conference.

"In the past, if you used a PowerPoint presentation, you needed to use a 20-point font on a clear white background just to see anything. Now you can project an Excel spreadsheet and still see it clearly," DiFiglia says.

But the highlight of the 600 is the ability to separate the camera and the microphone from the central iPower unit, which provides deployment and upgrade options.

The 600 is slimmed down in other ways, including fewer I/O jacks for connecting peripherals, lower data rate transfers and fewer ports for IP and ISDN connections. The 900 has a Pentium processor, while the 600 features a Celcra processor.

The PictureTel 600 costs \$6,995 and is available now.

PictureTel: [www.picturctel.com](http://www.picturctel.com)



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Tolly on Technology . Kevin Tolly

## WILL CISCO SUFFER YAHOO'S FATE?

Invincibility is binary. You either are invincible or you aren't. Until recently, Yahoo and Cisco seemed deserving of the accolade. Now neither

can make that claim. The question in my mind is whether Cisco is in store for what Yahoo has experienced.

While operating in different parts of

the new economy, each was a juggernaut in command of its market — "the" brand — and often miles ahead of the competition. Each had a special power

over its customers that inspired or commanded loyalty. Now at least in the case of Yahoo, that invincibility seems to be the root cause of a backlash more severe than that being felt by others. And the similarities to Cisco are eerie.

A page one story in the March 9, 2001 *Wall Street Journal* detailed the unraveling of Yahoo. According to the CEO of Geocities, a firm Yahoo acquired in 1999, the parent company was "alienating the clients they would some day need the most." His criticism was leveled at "the company's aggressive sales tactics."

"People hate you. You're arrogant and condescending. When there's a downturn in the market, they'll cut you first," a source in the article said. It appears that is what has now happened. Might Cisco suffer the same fate?

Without knowing how many purchase orders were cut out of sheer loyalty to product and brand vs. those deals consummated with the help of management pressure, we can't answer that question — yet.

What we do know is that, for years now, Cisco has replaced IBM as the "safe" vendor — nobody ever got fired for buying Cisco. There is significant anecdotal evidence that some network managers got in hot water for not wanting to buy Cisco. Might Cisco have alienated key clients by going above their heads?

With its leadership position, insanely high market cap, usually decent products and "can-do-no-wrong" armor, many network managers made the pragmatic decision to go with flow and buy Cisco.

Given Cisco's "darling" status in the stock market, I often wondered how many of the purchase order-approving executives were also holders of nontrivial amounts of Cisco stock. By helping Cisco, they were helping themselves — and Cisco's continued rise became a self-fulfilling prophecy. With the stock way down and the first layoffs in 17 years underway, Cisco may have lost its most important weapon: perception.

Until now, that has enabled Cisco to prevail over reality, the reality that when compared to the competition Cisco's products typically exhibited lackluster performance, less-than-leading-edge features and sported the highest price tag. In effect, they thumbed their nose at the "faster, better, cheaper" mantra that typically drives the technology business — and got away with it.

Within the industry, Cisco has been almost critic-free. For the most part, the company has been able to manage the analysts as well as manage its customers.

With the aura of invincibility gone, it is likely that a gaggle of long-repressed customers (and perhaps some analysts) finally will come forth and tell us how they really feel.

*Tolly is chairman and CEO of Tolly Research and founder, president and CEO of The Tolly Group. He can be reached at ktolly@tolly.com.*

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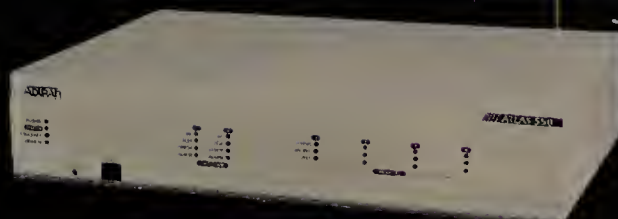


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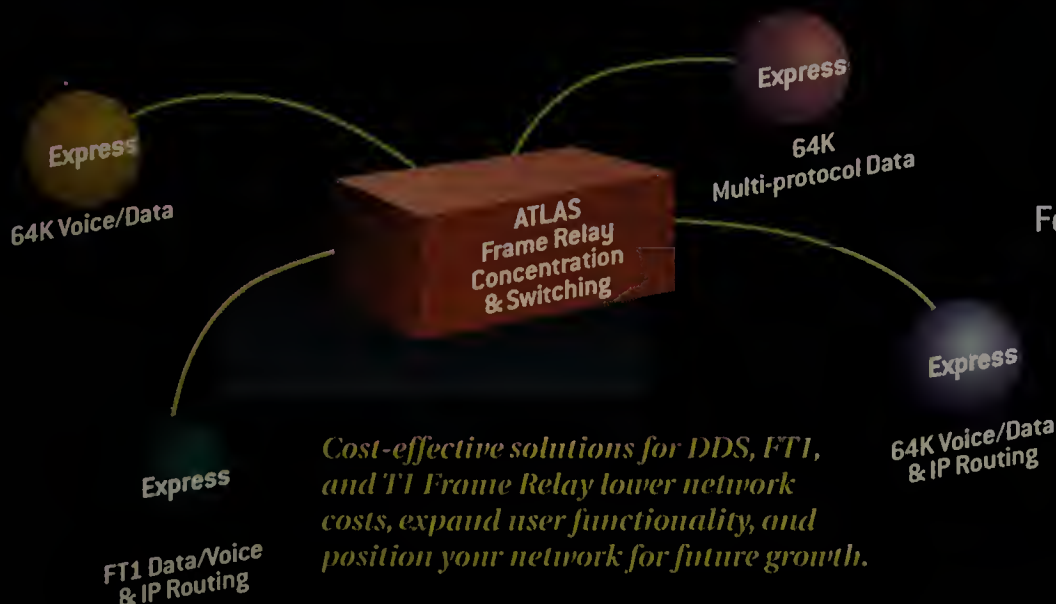
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# Carriers & ISPs

The Internet, Extranets, Interexchange  
and Local Carriers, Wireless, Regulatory Affairs

## Briefs

**WinStar Communications** is putting the brakes on spending and issuing pink slips to 2,000 employees. The competitive local exchange carrier, which offers fixed wireless and traditional voice and data services, announced recently that it is halting domestic and international network expansion plans. WinStar also says it is working on a new business plan.

The main group coordinating the technical standards for current and 3G wireless services, the **Third Generation Partnership Project (3GPP)**, is backing a Japanese proposal for transmission of digital video over networks in a move to bring compatibility to wireless and wireline networks. With the backing of 3GPP, the new transfer format for MPEG-4 digital video now has the support of three major technical bodies.

"This brings the standardization of MPEG-4 and RTP [Real-time Transfer Protocol] over the Internet and wireless networks," says Midori Suzuki, a spokeswoman for Toshiba.

**Qwest Communications** said last week it plans to apply to re-enter the long-distance market in one of the 14 states where the provider offers local service, although that state was not specified. Qwest was forced to exit the long-distance market when it acquired US West last year. The service provider can re-enter the market once it proves there is competition in the local services market in each service area.

According to Qwest officials, the company plans to apply to the Federal Communications Commission to re-enter the long-distance market in all 14 states by 2002.

Qwest: [www.qwest.com](http://www.qwest.com)

## New roaming services key to wireless

BY ASHLEE VANCE  
AND MARC FERRANTI

The wireless world is moving toward 3G high-speed networking, but several obstacles must be overcome before users can transmit data at 384K bit/sec using their wireless handsets.

Just as wireless service providers need to deploy new hardware and software to support data transmissions that are 20 times as fast as the speediest mobile service today, they will also have to map out roaming and interconnection agreements.

Network operators are scrambling to make connections that will let these next-generation wireless networks deliver the same level of domestic and international roaming service as standard wireless voice networks such as GSM or Code Division

### Wireless acronyms defined

New technologies bring new acronyms. Make sense of the alphabet soup.

**3G:** Third Generation wireless. An international movement toward upgrading wireless technology and networks to support mobile wireless data transmissions at 384K bit/sec and fixed wireless data transmissions at up to 2M bit/sec.

**CDMA:** Code division multiple access is first-generation wireless network technology.

**CDMA2000:** One of several 3G-technology proposals sent to the International Telecommunication Union, which Sprint PCS says it will deploy.

**GSM:** Global system for mobile communications is considered a first-generation wireless network technology.

**GPRS:** General packet radio services is a 2.5G technology that supports data transmissions up to 144K bit/sec. Many GSM service providers are considering GPRS before jumping to a full 3G upgrade.

Multiple Access (CDMA).

While CDMA networks are more popular in the U.S., there are several GSM wireless service providers in North America. And the GSM numbers in the U.S. are set to grow as AT&T Wireless upgrades its dated Time Division Multiple Access network to

GSM-based 3G technology called general packet radio services (GPRS).

GPRS is an interim technology that is typically called 2.5G because it supports up to 144K bit/sec instead of the 384K bit/sec support, which by definition is a requirement for any 3G network.

Service providers say they are ready for GPRS, but have yet to address how they can support regional or international roaming that will let users make and receive calls as well as transmit data.

GPRS roaming services won't happen until network operators implement GPRS Roaming Exchange technology. Service providers are testing the technology, but industry insiders say roaming support that includes data traffic will not be available before year-end.

Analysts agree that a roaming system is key to GPRS's success. The advantage of GPRS is significant for mobile professionals, eliminating the need to establish slow dial-up connections to send e-mail or surf the Web. But those buying such services will also want roaming support.

"For the end user, it could mean a lot less hassle in trying to figure out where you have coverage," says Aberdeen Group senior analyst Kelly Quinn. "It will mean convenience and ease of use."

GSM provides users with near-universal intercountry roaming support, especially in Europe. But roaming will quickly turn into a luxury when service providers begin upgrading to GPRS. Roaming agreements must be forged between wireless service providers and ISPs.

"You have to have the same functionality in the data world as you have had in the voice world, and to do that you need [GPRS Roaming Exchanges]," says Stephan Deutsch, a spokesman for UUNET, a division of WorldCom. "The idea is to connect as many people with each other and make sure you are the company connecting them."

Network infrastructure and management companies such as WorldCom, Equant and Infonet Services are pushing to be leading providers of these wireless exchanges.

GPRS Roaming Exchanges standardize access point name addressing, security protocols and GPRS call routing over  
See **GPRS**, page 28

## Sprint extends its wireless reach

BY MICHAEL MARTIN

**KANSAS CITY, MO.** — Sprint revealed last week that it has expanded its wireless multichannel multipoint distribution service coverage through agreements with other MMDS license holders.

With the agreements, Sprint says it can offer wireless voice, video and data services to 90 markets across the country.

Some of Sprint's most recent additions include arrangements with holders of spectrum for Instructional Television Fixed Service — educators who were allocated spectrum in the MMDS auctions by the Federal Communications Commission.

Sprint is using MMDS to offer its Sprint Broadband Direct service in 14 markets. Broadband Direct is targeted at consumers and small businesses, offering download speeds ranging from 1M bit/sec to 1.5M bit/sec and upload speeds of about 250K bit/sec. Prices on the business offering, which includes multiple IP addresses, range from about \$150 to \$200.

Todd Rowley, vice president of spectrum management for Sprint, says the provider won't be adding more markets

until it has decided on a vendor for its second-generation wireless equipment. The selection process should be finished this year, he says.

Second-generation broadband equipment operates without requiring line of sight to a transmission tower.

Robert Rosenberg, president of InSight Research, a telecommunications market research firm, says there are plenty of opportunities for larger players such as Sprint to add to their spectrum holdings.

"A number of the wireless companies, like Teligent and WinStar, are hanging by a thread, and the ones that will survive in this market are the ones with the deep pockets," he says.

Although wireless broadband may not be widespread, Rosenberg says it will catch on as an alternative when laying fiber or leasing a landline is too expensive. "It's a relatively cheap way to get around the incumbent carrier," he notes. ■

### Wireless

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# Exodus expands metro Ethernet services via Telseon

BY JENNIFER MEARS

SANTA CLARA — Exodus Communications data center customers who

want fast, large-capacity connections between their offices and hosted systems can now get the service directly from Exodus, thanks to its partner-

ships with metropolitan Ethernet service providers.

Exodus recently said it will resell services from Telseon, following an earlier announcement that it entered into a reseller agreement with Yipes Communications, a Telseon competitor.

Scott Emo, director of product marketing for Exodus, says partnerships with other metropolitan-area network providers can be expected as Exodus expands its network to link with customer sites. In addition to giving existing customers the ability to connect Exodus-hosted systems with their offices and business partners, the expanded network will provide a greater opportunity for Exodus to offer bandwidth-intensive services such as storage and tape backup services to new users, Emo says.

Andrew Feldman, a vice president at Santa Clara firm Riverstone Networks, hosts applications and storage systems with Exodus and contracted with Telseon separately to get the bandwidth those systems demanded.

"It would have been a whole lot easier for me if I went to one place and boom, they showed me a brochure and

## Exodus fans out Ethernet

The first Exodus data centers to have metropolitan Ethernet services are in:

- Silicon Valley (Telseon and Yipes)
- New Jersey (Telseon)
- Chicago (Telseon and Yipes)
- Washington, D.C. (Telseon)
- Boston (Yipes)

said, 'Here, you want a 50 [M bit/sec] service? I've got that. I'll get that right to your cage,' " he says.

Feldman says Riverstone now can make additional use of Exodus, such as housing streaming videos for sales training.

"What the Telseon service enables me to do is to utilize what Exodus is good at — the content hosting,

the value-added services — and get them to me at a speed that enables me to use all these fun tools," he says.

Telseon is deployed in 20 U.S. metropolitan areas, but the first Exodus data centers to be connected will be in the Silicon Valley, New Jersey, Chicago and Washington, D.C. The Yipes service is initially available in Boston, Chicago and the Silicon Valley.

Customers buy the Telseon service from Exodus, which charges a one-time setup fee, and then a monthly fee for access and capacity. Telseon offers bandwidth on-demand in increments from 1M to 1,000M bit/sec via a Web-based provisioning system.

Exodus: [www.exodus.com](http://www.exodus.com); Telseon: [www.telseon.com](http://www.telseon.com); Yipes: [www.yipes.com](http://www.yipes.com)

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## GPRS,

continued from page 27

Internet domain name servers, according to Nick Stratta, director of mobile services for Equant, in Slough, England.

These exchanges eliminate the need for every wireless carrier to have peering agreements with each other as well as with hundreds of ISPs. GPRS Roaming Exchanges acts as public network access points or exchanges on the Internet. The system lets providers route calls into the exchange, which then forwards the calls to the proper destination network.

Equant is working with Finnish tele-

communications operator Sonera to develop and market its GPRS Roaming Exchange to service providers around the world. VoiceStream Wireless has deployed the system overseas. Domestically, VoiceStream is working with Telecommunications Services, which has deployed exchanges in Seattle, Kansas City, Mo., and Boston.

WorldCom is another service provider that says it will support next-generation wireless exchanges and is expected to test systems by the end of June.

Roaming support is the latest piece of the GPRS puzzle. Even before roaming services come into play, handsets need to become more widely available. Companies such as Cingular, VoiceStream and Microcell will have networks outfitted for GPRS. But all are waiting for handsets in mass-market quantities before they can offer more than trial services.

"This is the standard chicken and egg problem," says Scott Palmquist, a Cisco product manager. "You need to have the handsets first, and then show the advantages of roaming."

Vance and Ferranti are correspondents for IDG News Service. Network World Senior Editor Denise Pappalardo contributed to this story.

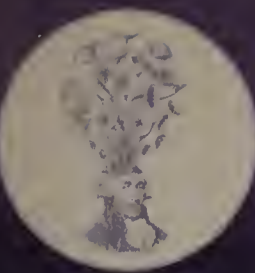
[www.nwfusion.com](http://www.nwfusion.com)

## MOBILE INTERNET

Download an abstract from the International Telecommunication Union's Web site and read more about GPRS's specific applications.

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3828  
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“I exchanged time  
with my network  
for time with my  
customers.”

*Nigel Panter  
Routed IP Director  
Band-X Corporation*

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**RiverSoft**



# Upstart VPN services staking out new ground

BY TIM GREENE

In the rapidly evolving world of VPNs, some service providers are trying things that defy easy classification yet can be a good match for particular firms.

Conventional VPN service providers — if you can use that term for such a young market — manage equipment they set up at your sites and issue VPN clients to dial-up users. WorldCom, for instance, offers this style of service, and absent the outsourced management, this is similar to what you might do if you built your own VPN.

Other conventional service providers start the VPN within their network so the secure tunnels created by the VPN end at the provider's point of presence (POP), not at customer sites. Customer traffic runs over unsecured access links between POPs and customer sites. The argument for this model is that these links are secure enough.

Some upstarts offer VPN services based on other, less-conventional models. For instance, CoreExpress is building a backbone network and guarantees quality

of service across it using its own network tied to the access networks of AT&T, Genuity, Sprint and UUNET.

At the moment, customers still have to install their own VPN gear at the ends of the connections, but they get guaranteed network performance because the traffic flows over CoreExpress' network, not the Internet. Within six months the company plans to offer VPN services through agreements with other vendors, according to Greg Davis, vice president of marketing.

CoreExpress leases fiber links from two carriers, Williams Communications and Level 3 Communications, and lights it up with Sycamore optical core switches that it feeds with Juniper edge routers and Cisco core routers. Customers must buy Internet access from one of the four ISPs. Before accepting a customer site and making service-level commitments, CoreExpress tests how fast traffic gets from customer sites to the CoreExpress edge routers. If it is not fast enough to support a maximum site-to-site delay of less than 150 msec, CoreExpress won't provide the service.

This service is attractive to Magellan Health Care, which manages mental health and substance abuse care for health plans, insurance companies and large employers. As Magellan gets new clients, it needs to tie them into the firm's network, generally within 60 days.

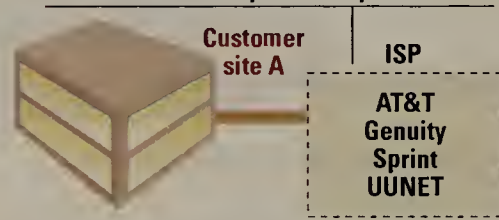
That's not enough time to get a frame relay connection, the firm's traditional way to connect sites. But it is enough to get a dial-up connection to one of the ISPs, says Bob Odenheimer, Magellan's senior vice president

**VIRTUAL PRIVATE NETS:**  
*Start-up providers offer different spins on what companies want from VPN services.*

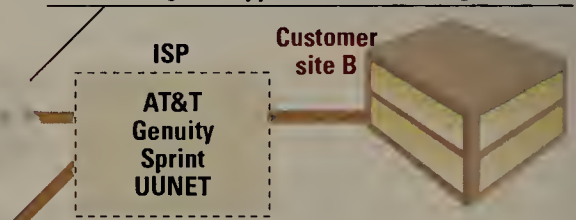
## CoreExpress dodges the Internet for faster networking

Among vendors doing VPNs differently today, CoreExpress peers with key ISPs. Rather than running connections over the Internet, CoreExpress ties customer sites together over its own, predictable fiber backbone.

1 Customers sign up with one of the four ISPs with which CoreExpress has peered.



2 CoreExpress makes sure the ISP access network is fast enough to support service-level agreements.



3 Based on this prequalification, CoreExpress offers customers site-to-site performance guarantees.

for IT, operations and telecommunications. Dual ISDN lines offer 256K bit/sec links to an ISP, he says, and the CoreExpress backbone gives the performance that customers need. "Our customers have certain expectations: They need faster-than-normal Internet response times, and they need consistent response times," Odenheimer says, adding that CoreExpress provides both.

He wants VPN protection for his net and talked to CoreExpress about installing such security on the PC-based network-monitoring devices CoreExpress places at each customer site. "It's a Linux box, and it wouldn't be difficult to build in VPN protection," he says.

OpenReach is another VPN service provider customers can turn to when they need connections to new sites installed quickly, says Andrew Yashchuk, network director for NeBo, an Oakbrook Terrace, Ill., firm that links medical facilities to its data center and to insurance companies. If a customer site has a 'Net connection, he can tie it into the NeBo VPN within days.

OpenReach sells software that customers load on PCs to create IP Security VPN gateways they install at each site. OpenReach's network operations center assigns each gateway an IP address and acts as a certificate authority for authenticating sites with each other.

OpenReach charges a flat monthly fee between \$300 and \$1,000 per month per site, depending on the speed of the site's Internet connection.

"Our main reasons for using the service are the price for the bandwidth and the speed of installation,"

Yashchuk says. "We can get a hospital up and running without getting involved with the phone company and with a minimum involvement of the hospital's IT staff."

Another upstart that is attractive for speed of installation is Exario, which specializes in DSL connections. Exario goes to other service providers and buys DSL connections to customer sites, eliminating that often considerable hassle. It manages network-based firewalls, authentication and encryption, and runs a Web site where corporate telecommuters get step-by-step instructions on how to join the corporate VPN.

Exario is notable for taking the virtual out of VPN, says Kevin Murray, CIO of insurance firm AIG. "This is private DSL as opposed to a virtually private session where you are just slightly separated from the public Internet," Murray says. "That's important to me if I'm running a business application with sensitive data or if I need known performance characteristics." To give this service, Exario runs its national Multi-protocol Label Switching-based net on leased fiber.

SmartPipes is a new provider with its own take on VPNs: Make it easy to manage these networks, and you will attract customers. Its technology lifts the burden of having to configure VPN policy changes device by device via command-line interfaces, reducing errors and saving staff time, the company says.

Instead, customers log the IP addresses and configuration data about their Cisco routers and Windows 2000 VPN clients into SmartPipes' Policy Engine and can make policy changes using a graphical interface on a secure Web page. The policy engine then reconfigures all the network devices to reflect the changes.

"It's much easier to manage when it's graphically put up there," says Scott Singer, CTO of systems integrator Native American Systems. And it works across any ISP.

In addition, the system will kick back policy changes that the VPN gear cannot support.

There are other companies pushing unique VPN services or pieces of services, and customers have to ask, "When do I look at these guys vs. the more conventional providers with CPE-based or network-based services?" says Jeff Phillips, an analyst with TeleChoice.

He notes that providers such as OpenReach and CoreExpress make it relatively easy to set up business-to-business extranets. Others, such as CoreExpress and Exario, offer service quality guarantees, something that cannot be done yet over the Internet.

Phillips says these firms are untested but are positioned well if demand for building VPN extranets increases. ■



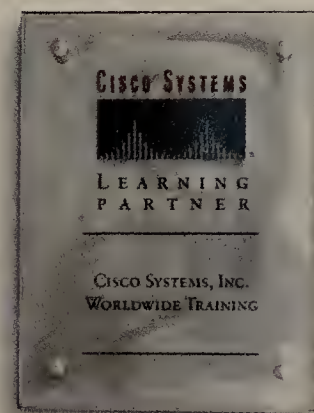
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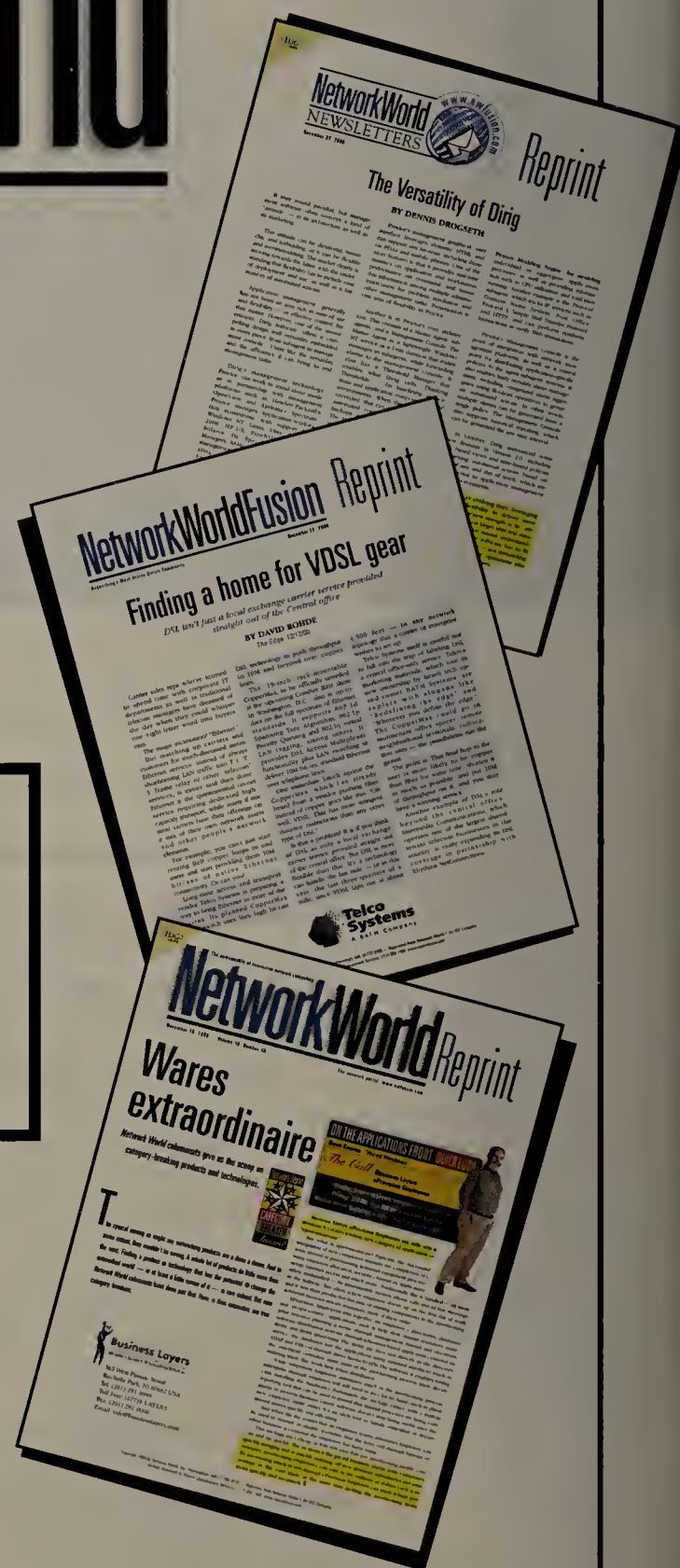
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# The Edge

Service provider developments at  
the juncture between the enterprise  
and the new public network

## Briefs

Nortel Networks and Agilent Technologies have agreed to jointly develop and market an optical management system.

The offering will be designed to let service providers quickly determine when logical alarms are the result of physical fiber problems, and where those problems are located. It will combine the functions of Nortel's Preside network management and Agilent's accessFiber products.

The integrated offering will be available at the end of the year. Pricing was not disclosed.

Nortel: [www.nortelnetworks.com](http://www.nortelnetworks.com); Agilent: [www.agilent.com](http://www.agilent.com)

Lucent announced last week a Fibre Channel over IP (FCIP) module for its OptiStar EdgeSwitch that lets storage administrators bridge storage-area networks (SAN) over IP.

Bridging SANs over distance allows data backup, data replication and hosting over existing carrier nets. The OptiStar EdgeSwitch FCIP Network Module works with other OptiStar modules for Gigabit Ethernet, OC-48c and OC-12c Packet over SONET.

FCIP capability will be available this summer. Pricing is not yet available.

Lucent: [www.lucent.com](http://www.lucent.com)

Sonus Networks made a \$200,000 profit for the first quarter of its fiscal year, and took in a total of \$41.5 million in revenue.

That's up from \$28.6 million in the previous quarter. A maker of packet-based telephony gear for service providers, Sonus also nailed down a deal last quarter with Qwest Communications to install Sonus gear in Qwest's nationwide optical network.

Based on an earlier sale, Time Warner is using Sonus gear to provide voice services in eight cities, Sonus says.

Sonus: [www.sonusnet.com](http://www.sonusnet.com)

## Optical switches need better grooming

BY JIM DUFFY

The troubles of two notable suppliers of optical switches for the core of service provider networks reveal the current dynamics of the core optical switching market.

Service provider capital expenditures have slowed dramatically, which would stall any market — the core optical switch market notwithstanding. Moreover, demand for meshing wavelengths takes a back seat to grooming at the edge of the core. Carriers want their STS-1s and they want them now, money or no money to spend.

The inability to groom is what killed Cisco's ONS 15900 and backlogged Sycamore's SN 16000. Grooming enables more efficient transport of traffic by essentially multiplexing

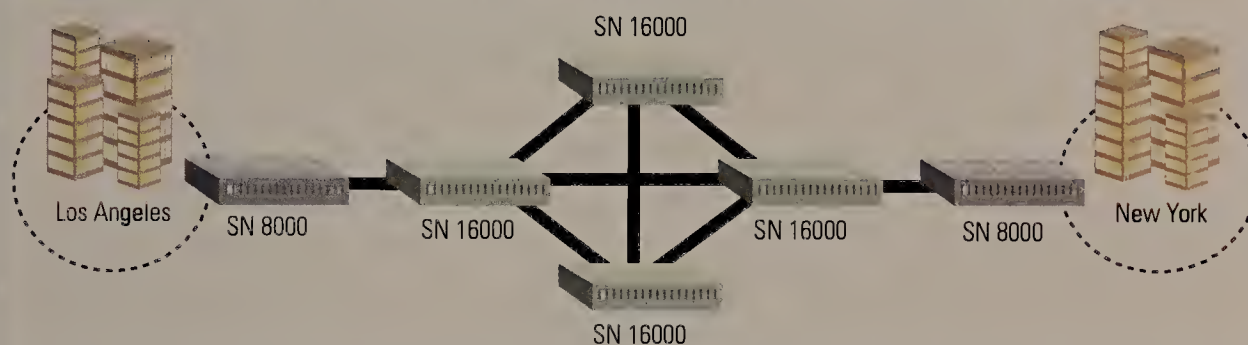
52M bit/sec STS-1 signals into higher-bandwidth (2.5G bit/sec OC-48) wavelengths.

Meshing, meanwhile, enables more efficient link restoration and dynamic provisioning.

length Router, which cost Cisco \$500 million to obtain through the acquisition of Monterey Networks in 1999 ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 3833). Indeed, there was a lack of demand for Cisco's wavelength meshing.

### Unable to mesh

Optical meshes for the core of carrier long-haul networks — such as those that could be configured with Sycamore's SN 16000 linking metropolitan networks built with the company's SN 8000s — have been slow to take off due to a decrease in carrier spending and vendor implementation issues.



Cisco was telling only half the story when it said lack of demand for meshing wavelengths in the core was the reason for discontinuing the ONS 15900 Wave-

"The Cisco switch was in essence an electrical fabric that tried to emulate a photonic switch," says Dave Krozier, an See **Optical switches**, page 34

## Appian unveils OSAP Ethernet service platform

BY TERRI GIMPELSON

BOXBOROUGH, MASS. — Appian Communications last week announced general availability of its Ethernet provisioning platform, its first customer and some new features to enhance interoperability with SONET, among other functions.

Appian's Optical Services Activation Platform (OSAP) 4800 switch dishes off bandwidth to corporate customers in pieces as small as 64K bit/sec via 10M bit/sec, 100M bit/sec or Gigabit Ethernet ports. The switch is designed for carriers that make direct fiber connections to customer sites, then sell services at speeds slower than OC-48.

Typically, carriers will place one of the switches in an office park or business high-rise and serve multiple customers off each one. Hooking up to an OSAP 4800 requires nothing more than an Ethernet port on a corporate router.

TelX, a collocation service provider in New York that manages connections between carriers, is Appian's first

announced customer for the OSAP 4800.

"We are using it for origination/termination voice circuitry as well as for figuring the metric for determining bandwidth," says Hunter Newby, TelX's executive vice president of strategic planning. "Configuration of circuitry can be changed very quickly."

New features for the OSAP 4800 include IEEE standards-based Ethernet flow control and an International Tele-

communications Union X.86-compliant Ethernet encapsulation scheme. This encapsulation technique lets users transmit Ethernet over SONET and SDH.

Other features include 10/100M bit/sec Ethernet media redundancy and a TL-1 SONET management interface. Appian says that OSAP offers 1:N redundancy for 10/100 Ethernet cards, port level protection for Gigabit Ethernet interfaces and IEEE 802.3ad load sharing and recovery.

Sterling Perrin of IDC points out that the OSAP box sits in a unique space that straddles Ethernet and SONET services, and offers a benefit to incumbents who are looking to offer Ethernet while maintaining their investment in SONET. Despite the apparent benefits, Perrin warns that the proof is in the pudding.

"All products at this stage in this space are brand-new," he says. "Everything needs to get proven in customer networks right now. Appian's biggest challenge is overcoming the newness of its product."

The OSAP 4800 starts at \$25,000. Appian: [www.appiancom.com](http://www.appiancom.com)

[www.nwfusion.com](http://www.nwfusion.com)

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# Riverstone's CEO outlines his post-IPO strategy

BY PHIL HOCHMUTH

While some CEOs of network equipment firms may see doom and gloom in their markets, Riverstone Networks' Romulus Pereira sees morning again in the metropolitan-area network arena.

In an interview with *Network World*, Pereira outlined the opportunities he sees to sell his switches, specifically in the data centers of application service providers (ASPs). He's banking on upcoming 10G Ethernet and OC-768 products that could help MAN providers and ASPs ease their bottleneck woes.

"The metropolitan area market is enjoying its own microclimate" apart from the spending slowdown in long-haul, Pereira says.

Tough economic times may prompt companies to outsource application and data center processing to MAN service providers and ASPs, he says. Also, large carriers aren't making enough money by selling bandwidth

or long-distance.

When Pereira talks about the bandwidth requirements that MAN service providers and ASPs need now, and will need in the immediate future, he throws around some big numbers.

"The hosting and [outsourced] data center people want to put in multiple 10 Gigabit rings ASAP. If they could have OC-768 today, they'd put it in," he says.

Pereira says Riverstone will have what MAN providers want when it ships a 10G Ethernet module for its RS 38000 MAN aggregation switch in August. Going a step further, Pereira says the company's next-generation aggregation box, which is in development right now, will have a slot for a 40G bit/sec, or OC-768, module. He says the next-generation switch is on track for release in the first half of next year, and that it will have a switch fabric with up to one terabit per second of bandwidth. The new switch is likely to be targeted at MAN



Despite the slowdown of infrastructure spending among carriers, Riverstone CEO Romulus Pereira sees immediate opportunities for his newly public company in the metropolitan access provider market.

providers who are aggregating multiple 10 Gigabit networks for connection to the Internet core.

Although he acknowledges that the ASP market has had troubles recently, Pereira says he sees an opportunity for his company to help ASPs rebuild their networks with Riverstone gear.

"Usually you have to learn to crawl before you can walk," he says. "[The ASP] market started running before it had any legs. There were no boxes in their networks to really guarantee any kind of [service-level agreements]."

Pereira cites collocation businesses such as Jamcracker, Loudcloud and Sight-

Smith as companies that tried to jump onto the ASP bandwagon but did not have the equipment to fine-tune bandwidth for applications. Although he wouldn't name names, Pereira says several ASPs are experimenting with Riverstone equipment in an effort to overhaul their infrastructures. ▀

## Optical switches, continued from page 33

analyst at RHK. "It did wavelength switching; it didn't have the grooming function. And as a wavelength switch, it was kind of a small one. It wasn't that competitive."

And Sycamore would have had a less disappointing third quarter if it had the components for line cards that would have added STS-1 grooming to its SN 16000 switch, analysts say. Sycamore had to drastically reduce third-quarter revenue forecasts, record a loss for the quarter and lay off 13% of its workforce, due in part to its inability to meet carriers' demands for grooming at the edge of the core of their networks ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 3834).

"The largest demand, rather for the version of the SN 16000 that offers wavelength routing, is for the version that offers grooming," Krozier says.

That's not to say that there is no market for optical switches that mesh wavelengths in the core. The worldwide market for optical cross-connects — all-optical and optoelectrical — will grow from \$76 million in 2000 to \$5.7 billion in 2005, a compound annual growth rate of 137%, according to IDC.

Cisco may think a \$76 million market in 2000 is not one that's red hot, but a 137% compound annual growth rate indicates a market that's rapidly heating. And abruptly killing a product designed to address future requirements indicates a problem with the product — not the market.

If the ONS 15900 was a competitive product for an emerging market, Cisco would have

incubated it a little more and made sure it was a viable offering once the market developed. It would not have killed the switch.

"The most direct competitors to the 15900 from a functional and practical standpoint are really Tellium [with the Aurora switch] and Ciena's CoreDirector to some extent," says Chris Nicoll, an analyst at Current Analysis. Both are doing quite well, Nicoll reports, as a core wavelength router and edge optical grooming switch, respectively.

Tellium has lined up service providers Cable & Wireless and Dynegyconnect for the Aurora switch, while Broadwing Communications has implemented a meshed optical core with Ciena's CoreDirector grooming sublamdas for Corvis' CorWave optical switches.

Broadwing committed at least \$200 million for its groomed optical mesh. It has revenue generation and cost benefits, the service provider says.

"It enables us to implement capacity and restore capacity relatively quickly and efficiently," says Chris Rothlis, vice president of engineering at Broadwing. "The ability to provision is what's winning business. We receive customers from several of our competitors who simply cannot provision."

In the cases of Cisco and Sycamore, the issues with their optical switch offerings for the core were more product-related than market-related.

"What you've run into is not necessarily the absence of a market, but really the absence of the right product to fit the market at this time," says Sterling Perrin, research analyst at IDC. "That grooming is in strong demand." ▀

## Lucent upgrades its DSL offerings

*Adds G.SHDSL and denser ADSL cards to Stinger line, adds voice to PSAX.*

BY MICHAEL MARTIN

DENVER — Lucent last week unveiled enhancements to its Stinger DSL access concentrators and PacketStar PSAX media gateways that increase port density and enable voice support.

At the DSLCon conference in Denver, Lucent rolled out extensions to the Stinger line that double asymmetric DSL (ADSL) port density and support the newly minted single-pair high-speed DSL standard (G.SHDSL). The PSAX upgrade lets service providers support voice-over-DSL services using existing Class 5 switches.

The new Stinger ADSL line cards support up to 48 users, meaning a single Stinger FS DSLAM can support up to 672 subscribers.

"Basically this would lower per-port costs and central

office space requirements," says Dennis Klein, a director with Lucent's next-generation access group.

Lucent will support the G.SHDSL standard through a software upgrade to its HDSL2 systems. Klein says Lucent didn't ship much HDSL2 equipment, because the G.SHDSL standard essentially froze the market for HDSL2.

G.SHDSL on the Stingers will support speeds ranging from 72K to 2.312M bit/sec and will run up to 30,000 feet from a central office with repeaters. One Stinger SHDSL line card will support up to 32 subscribers.

For its PSAX 1250 and 2300



Lucent's PacketStar PSAX media gateways now support voice-over-DSL using existing Class 5 switches.

products, Lucent is introducing the PSAX GR-303/ Loop Emulation Service gateway software, which will translate digital voice from DSLAMs into a format that can be understood by Class 5 switches. The software has been certified to

work with Lucent and Nortel Class 5s.

All the Lucent upgrades are available immediately. Prices are under \$180 per port for the Stinger 48-port ADSL card, and under \$250 per port for SHDSL. For the new PSAX GR303 capabilities, pricing is generally below \$145 per port. ▀





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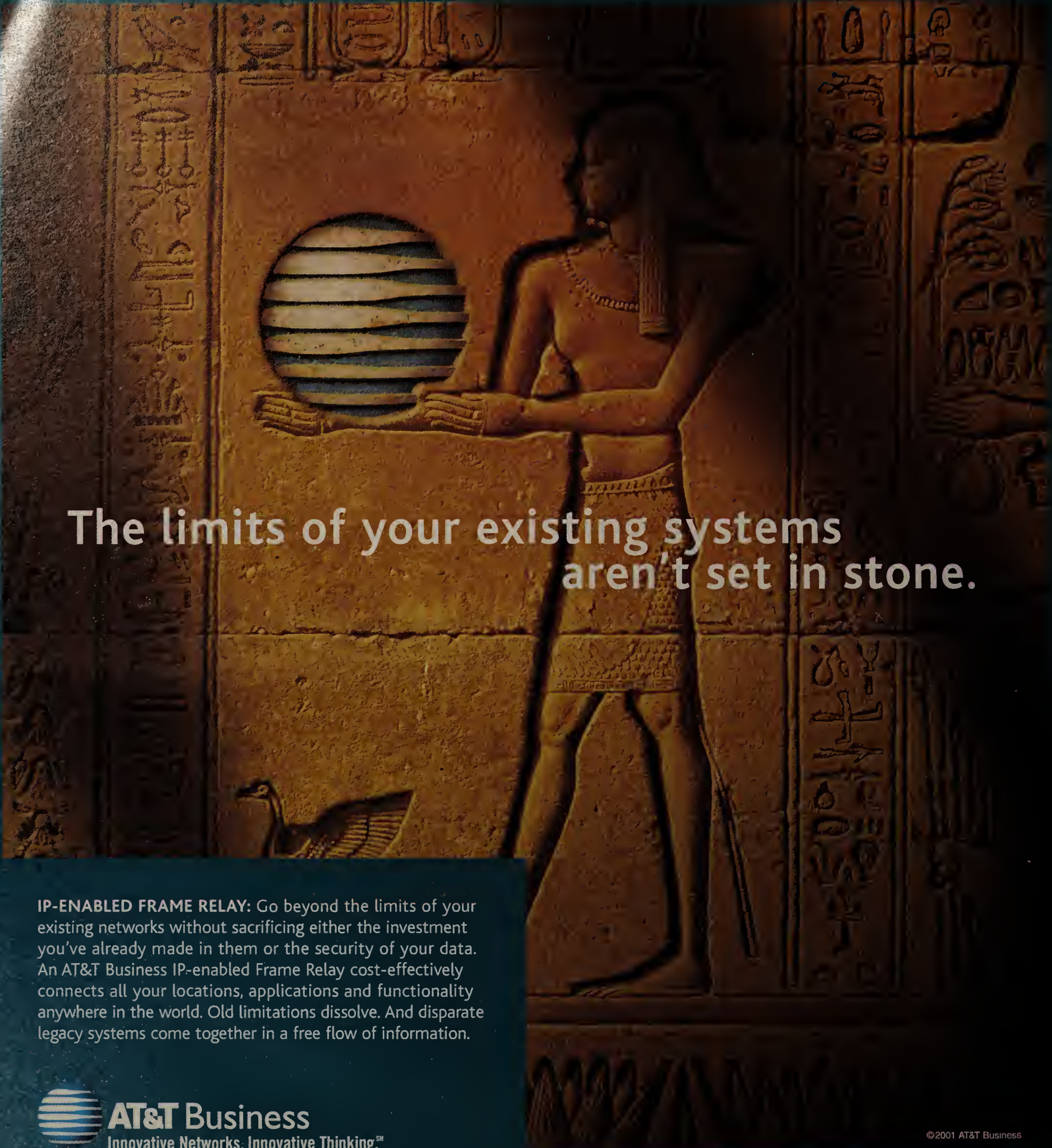
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## Briefs

Portal software vendor Plumtree is making it easier for enterprise customers to integrate SAP business functions into a Plumtree portal. The company, which uses so-called gadgets to embed disparate applications into a portal view, last week released Plumtree Gadget Suites for mySAP. Plumtree already has gadgets for SAP R/3. The gadgets allow businesses to access services such as SAP's WorkPlace MiniApps and Launch-Pad from the Plumtree portal. The announcement comes as SAP launches its own portal initiative, teaming with Yahoo to develop an enterprise portal package. Plumtree executives say additional SAP integration technologies can be expected in the months ahead.

Plumtree: [www.plumtree.com](http://www.plumtree.com)

Ivea Technologies, a Rainbow Technologies company, has announced CryptoSwift 400, a cryptographic accelerator that plugs into any Web server platform's open PCI slot to speed cryptographic processing. The accelerator provides 1024-bit RSA transaction processing in less than 4.9 msec. CryptoSwift 400, which costs \$8,789, processes security protocols such as Secure Sockets Layer and IP Security.

Rainbow: [www.rainbow.com](http://www.rainbow.com)

Entrust Technologies last week announced Entrust/PKI 6.0, a version of its public-key infrastructure software that supports Microsoft Active Directory in addition to Lightweight Directory Access Protocol and X.500 directories. Among other enhancements, Entrust keys and certificates can now be exported to the PKCS#12 format standard and Entrust's Enterprise Desktop product can be deployed in the Citrix Metaframe and Microsoft Windows Terminal Server environments. Entrust/PKI 6.0 starts at \$22,000.

Entrust: [www.entrust.com](http://www.entrust.com)

## MRO looks to ease procurement process

BY KATHLEEN OHLSON

As manufacturers and distributors transfer their catalogs online, they're dealing with an unwieldy process of centralizing product information and trying to differentiate themselves from the competition. In an attempt to ease their frustrations, supply chain vendor MRO Software last week released a new hosted software suite.

The suite, called MRO.com, targets distributors and manufacturers that develop industrial parts and equipment, such as pipes and valves. Manufacturers and distributors may set up a branded storefront or issue a Web link to buyers or marketplaces. Buyers would be given an ID and password to access the storefront or Web link, and then be able to browse customized catalogs.

The Bedford, Mass., company, which recently changed its name from PSDI, raked in \$168.7 million in sales for fiscal 2000. Customers include CE Financial, Mobile Oil, Nestle USA, and industrial goods and services marketplace Endorsia.

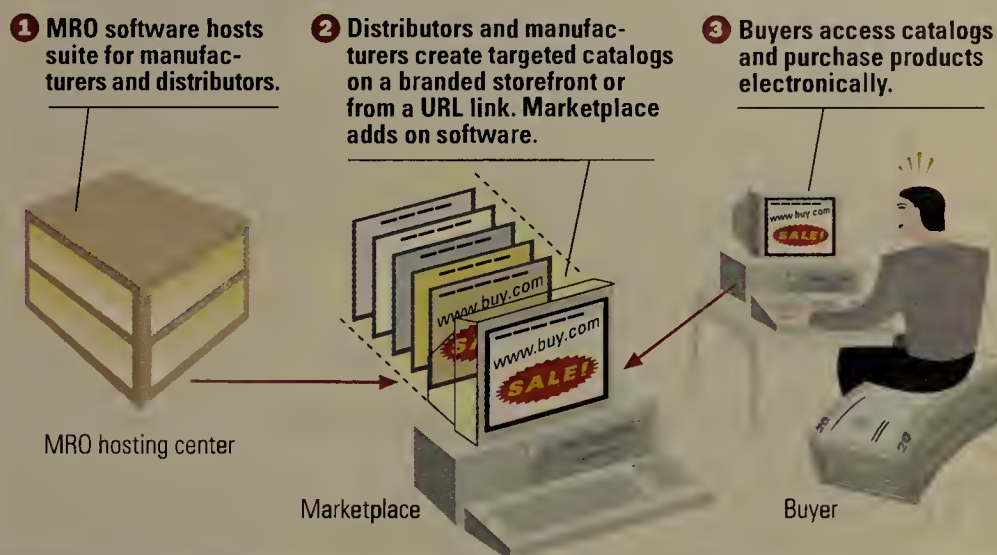
MRO.com is available now and consists of three software components:

- mroManufacturer: Manufacturers can create and maintain an online customized catalog that includes text, photos, drawings and item-specific Web links for individual buyers.

- mroDistributor: Distributors can create, maintain and customize online cata-

## Simplifying the procurement process

MRO eases procurement pathway for suppliers and marketplaces hosting catalogs.



logs featuring contract pricing, special products and only products relevant to a customer's business.

- mroConnect: The software allows suppliers using Manufacturer or Distributor to connect to marketplaces such as Trade-Matrix.

MRO Software stores the catalogs of distributors and manufacturers at its hosting center, and buyers can access their suppliers' products through the Maximo buying application and other vendors' buying software, such as Commerce One's BuySite

and Ariba Buyer.

Users say the added features will make it easier for them to manage different catalogs for different buyers.

"It'll let us handle multiple vendors at the same time, and it's nice to have this option, though we won't be doing anything with it right away," says Jack Webb, manager of supply chain technology for Ferguson Enterprises, a Newport News, Va., company that develops valves and other parts for industrial plants.

See MRO, page 38

## PGP working with NSA on Linux security prototype

BY MARGRET JOHNSTON

A division of PGP Security has entered a partnership with the U.S. National Security Agency and other partners to further develop the NSA's Security Enhanced Linux (SELinux) prototype, PGP Security announced last week.

Under a \$1.2 million, two-year contract, the NAI Labs division of PGP Security, a business unit of antivirus vendor Network Associates, will focus on research and development to improve security of open-source operating system platforms, particularly Linux, PGP Security says. The goal is to reduce the threat of security breaches caused by flawed applications or malicious code. The NSA chose Linux because its open-

development environment provides an opportunity to show that SELinux's security functionality can work in a mainstream operating system.

[www.nwfusion.com](http://www.nwfusion.com)

## CONTROLLING SECURITY

Read how the NSA has called for increasing the federal government's role as a contributor to open source software.

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The contract builds on the NSA's work in developing a set of new security controls for the Linux kernel and NAI Labs' work in developing a basic security policy configuration for these security controls and several additional kernel controls.

NAI Labs will work with the NSA and its other partners to develop additional security controls, configure the security policy and present the security enhancements to Linux users. SELinux includes security enhancements to the operating system that can enforce the separation of information based on confidentiality and integrity requirements.

Network Associates: [www.nai.com](http://www.nai.com)

Johnston is a correspondent with IDG News Service's Washington bureau.



# Kada releases Java Virtual Machine for Palm

BY JOHN COX

ANDOVER, MASS. — "Smaller is better" is the unofficial motto of Kada Systems, a young company that last week released a set of Java tools, APIs and its own version of a Java Virtual Machine to build applications for Palm OS handhelds.

The compact Kada Mobile Platform will let customers build database applications and deploy them to handhelds, transforming the handhelds into something more than computerized calendars.

Kada, formerly Emwerks, isn't the only vendor with a midget JVM alternative to Sun's versions in Java 2 Micro Edition. Hewlett-Packard created its Chai VM, and NewMonics released

for network equipment builders a version of its Perc software, including a VM for complex embedded applications.

The Kada VM comes in two versions, one running in 155K bytes of memory, the other 380K bytes. This is larger than Sun's equivalent, known as KVM. But unlike Sun's, the Kada equivalent software can support the full range of Java APIs, such as Abstract Window Toolkit, network connectivity, I/O and Java Database Connectivity, says Kada founder Shekar Mantha.

Kada Mobile hasn't been checked against the Java compatibility tests but has passed the publicly available Mauve tests. A prototype was announced last June at the JavaOne conference.

## PROFILE: KADA SYSTEMS

<b>Location:</b>	Boston
<b>Founded:</b>	Originally Emwerks, February 2000; renamed Kada Systems, January 2001.
<b>Product:</b>	Software to build and deploy Java applications on handheld devices.
<b>Management:</b>	Shekar Mantha, founder and CTO; James Acquaviva, CEO.
<b>Financing:</b>	Privately held; received a \$5 million investment in September 2000 led by JK&B Capital, Chicago.
<b>Employees:</b>	20; still hiring
<b>Fun fact:</b>	Founder Mantha is a native of India, CEO Acquaviva is second-generation Italian-American. Yet they look so much alike that a standing joke between them and among employees is that they were twins separated at birth.

Using Kada Mobile, developers at Baton Rouge International (BRI), a Louisiana software consulting firm, are writing a Java program that works with a small Java database on the Palm

device, and later synchronizes data through a cradle connection with an Oracle server. Palm users can collect data in the field, process it, change it and later upload it to corporate applications, says Sumit Sinha, one of BRI's consultants. Sinha started with Sun's JVM but switched to the Kada software because it incorporated more of the Java features he needed.

Kada Mobile is available now. The introductory, bare-bones development kit is \$295 and can be downloaded from the Web site. There are two subscription services: Basic edition, for \$895 per year, includes the tool kit, plus subsequent releases, enhancements and technical support; Professional edition, for \$3,395 per year, adds 100 deployment licenses (which otherwise are priced separately) and other services, such as a dedicated Kada account manager and priority technical support.

Kada: [www.kadasystems.com](http://www.kadasystems.com)

# TruSecure rolls out risk-assessment services

BY ELLEN MESSMER

RESTON, VA. — TruSecure last week detailed round-the-clock risk-assessment services to help enterprise customers and ISPs combat computer viruses, hackers and inappropriate network use, and ensure a high level of security practices.

With the risk-assessment service, TruSecure makes security staff available around the clock. The staff strives to ensure that each corporation carries out good security practices, such as

patching any newly discovered security holes in Web and operating system software, or adopting strong passwords.

Under a fixed-price subscription plan that starts at \$75,000 per year, TruSecure first conducts a security audit to assess vulnerabilities in an organization's server and desktop environment using risk-assessment tools from security vendors such as Internet Security Systems in addition to TruSecure's own. Several assessments are done each quarter, and the data

is stored in an Oracle-based database available to corporate security managers via a Web browser.

"We now have 40 employees, backed up by our labs, that are dedicated to this program," said Peter Horst, senior vice president and chief marketing officer at TruSecure, formerly known as the International Computer Security Association.

With about 100 employees, TruSecure also operates the Carlisle, Pa., ICSA Labs, where research and product testing on

antivirus software, firewalls and IP Security-based products is conducted.

Pharmaceutical giant Pfizer uses the TruSecure risk-assessment services to protect its huge mixed network of Windows NT and Unix servers. "Our auditors ask us to do security analyses periodically, and TruSecure gives us an extra set of eyes to help do that," said Jeff Brewer, Pfizer lead security analyst.

TruSecure, which makes regular visits to Pfizer in addition to running remote scans, is quick at responding to inquiries as well as sending out alerts when new vulnerabilities are discovered, Brewer said.

Pfizer selected TruSecure over ISS and other providers of security services. While Pfizer is reluctant to discuss how the competitive bidding process played out, Brewer said Pfizer now regards TruSecure as its "think tank" on security issues.

TruSecure: [www.trusecure.com](http://www.trusecure.com)

# Security policy features on tap from Tivoli

BY DENISE DUBIE

SAN FRANCISCO — Tivoli Systems has upgraded its security software to better control access to applications and data for users of its WebSphere and MQSeries packages.

At the RSA Security Conference last week, Tivoli added support for IBM's MQSeries messaging software and WebSphere middleware to its SecureWay Policy Director Version 3.7. The software will let customers centrally manage the authentication of end users

and ensure only the appropriate network resources are accessible to them.

The idea behind the new release is to let customers define a policy once and have it deployed automatically across MQSeries and WebSphere applications. The support saves customers from recoding the applications individually. SecureWay also lets users manage security from a single, central console.

Policy Director can be installed on a variety of servers, including Unix; Win-

dows 95, 98 and NT 4.0; RISC; and Sun Sparc.

With the package, users predefine access rights, and the software distributes them accordingly.

Typically, developers have to write security code for each application, but with Policy Director the process is automated, the company says.

Policy Director 3.7 is now available, and pricing is based on the number of users. Policy Director for MQSeries' pricing is based on server configuration.

Tivoli: [www.tivoli.com](http://www.tivoli.com)

**MRO,**  
continued from page 35

Webb hasn't seen any problems regarding the suite crop up, but he wants MRO Software to roll out additional features — including electronic invoice and payment, and supplier, buyer and marketplace reports — on a timely basis.

Tim Minahan, an analyst at Aberdeen Group, says easing the burdens of moving online will be a main focus for vendors such as MRO Software.

Suppliers generally become commoditized and aren't able to differentiate themselves from one another, he says. "Suppliers are finally saying, 'We don't want to be marginalized,' and they want to do the work [creating the catalogs] only once," he says.

Pricing for all the software components is based on an annual subscription. Pricing for Distributor and Manufacturer is based on the size of the catalog.

MRO Software: [www.mro.com](http://www.mro.com)

## Security

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# Do more with your bandwidth

Sitara Networks' QosWorks 10000 provides powerful quality-of-service features.

BY CHRIS GRIFFIN  
AND GREG GODDARD

Enterprise networks are stressed to the limit but still are expected to transport more business-critical services than ever. This is where network quality of service can save the day.

The QosWorks 10000 is the latest in Sitara Networks' line of quality-of-service (QoS) appliances that sit between a LAN and WAN router, letting network administrators monitor and manage expensive network bandwidth. This model supports data rates up to 100M bit/sec and has an integrated Pentium III 600-MHz processor, dual 10/100M bit/sec Ethernet interfaces and some fairly sophisticated software, all integrated in a Web-based management interface.

We found installation to be a breeze, management painless, and performance as advertised. We would like to see Sitara include additional intelligence to assist in classifying a wider variety of traffic, as well as additional features to secure the unit from unwanted visitors.

The device is set up to monitor traffic only, and not enforce any default policies. This is important because it lets the user get acquainted with the user interface without the risk of downing the network. The Ethernet ports are labeled LAN

and WAN, and are designed to plug into a switch/hub and router respectively.

To baseline performance, we ran throughput tests using different Ethernet frame sizes at 100M bit/sec. In most cases, QosWorks passed line-rate traffic across its interfaces. We only noticed loss using 64-byte frames.

To test the bandwidth management capabilities, we started with a 10M-bit/sec WAN, using NetIQ's

Chariot software to generate traffic between both networks. We generated a total of 25M bit/sec of traffic consisting of HTTP, FTP, Simple Mail Transfer Protocol and User Datagram Protocol (UDP)-based RealVideo streams while running the QosWorks in monitor-only mode. We noticed the videostreams were using most of the available bandwidth.

We used the Web management interface to create policies that limited the videostreams and SMTP each to 20% of the available bandwidth and left the remainder to all other IP traffic. The videostreams, which were previously dominating the WAN connection, were now clearly limited to 20%. On the other hand, SMTP received the bandwidth it needed using only half of its 20% allotment, with FTP and HTTP traffic garnering roughly an equal share of the remaining resources. Because we didn't allow bursting above the configured maximum, 10%

of the link remained idle from the unused SMTP bandwidth.

To test the full capacity of the box, we changed the WAN connection to 100M bit/sec. QosWorks can limit the amount of traffic that passes across the WAN, but it is unable to directly control the amount of data that "touches" the LAN interface, which can cause congestion independently of what goes on over the WAN link. TCP, which has built in flow-control mechanisms, can correct for this, but unacknowledged UDP packets will continue to bombard the LAN interface.

To start the new round of tests, we used Chariot to create 10M bit/sec of SMTP traffic, and 30M bit/sec each of FTP and HTTP traffic, as well as 50M bit/sec of UDP-based RealVideo streams. We created policies that gave FTP 30% of the bandwidth; SMTP and HTTP, 20% each; with the remaining 30% allotted to AnyIP. We also gave priority to HTTP traffic, and let each category of TCP traffic burst to twice their allocated values.

Before we applied the policies, RealVideo and FTP streams dominated the WAN, with HTTP and SMTP much lower than desired. After applying the policies, the RealVideo streams dropped to 30M bit/sec, but the TCP-based traffic was lower than expected. The cause appeared to be congestion at the LAN interface, which resulted in the TCP traffic slowing due to flow control.

To verify this, we reduced the amount of UDP traffic being transmitted, which showed the TCP-based traffic returned to expected levels. Because SMTP was not using its full bandwidth allotment, the high-priority HTTP traffic could burst above its 20M bit/sec maximum as we had configured.

Finally, we added a voice-over-IP call while attempting to transfer a 50M-byte file

across the WAN. We altered the policies to reserve 5% of the bandwidth for voice-over-IP devices, and an additional 10% for traffic to and from our Windows 2000 Server. Prior to implementing the policies, the branch office voice-over-IP phone was unable to place a call across the WAN link, and the file transfer was slow and bursty. After the policy change, we could place a voice call across the WAN with a minimum of jitter or distortion, and the simultaneous file transfer was steady and near the desired rate.

The QosWorks 10000 features real-time traffic flow monitoring. It can classify traffic by application/port or by address of the sender or the receiver. If operating by application/port, the unit will attempt to recognize the traffic by application. If it doesn't know a particular application, you can also build custom port filters to help an identification see a port number. Unfortunately, some new applications use random ports on both ends, which makes it difficult to classify these types of traffic by application. Traffic is also classified by port, but the management interface does not distinguish whether the port is source or destination, which can be confusing.

For traffic control, you can set QosWorks filters based on traffic type, source address/mask, destination address/mask, and port numbers. Once a filter is in place, it can be applied toward a policy class, which is the mechanism used to support bandwidth restrictions and priorities. The QosWorks platform has a slew of ways to carve your bandwidth, including setting limits, burst ceilings, priorities, time of day, and even session bandwidth, which can guarantee each session a minimum allocation with admission control. You can even have it mark the type-of-service byte, which can be used by other QoS-aware devices on your network, although QosWorks 10000 cannot act based on the type-of-service byte.

You can generate graphical reports that are used to determine

## How we did it

The main office and branch office networks were comprised of Cisco Catalyst 2924XL and 5500 switches and route switch modules. Each network consisted of several Windows 98, NT, 2000 and Linux workstations. We also had a Win 2000 server located on the main office network. Each office also had a voice-over-IP phone, and the main office housed the call manager, which serves to connect and manage calls.

We used Spirent Communications' SmartBits 2000 cards for network throughput and packet loss testing and NetIQ's Chariot for generating application-specific traffic.

For throughput and packet loss, we tested the QosWorks 10000 with two ML-7710 Fast Ethernet cards in a SmartBits 2000 chassis using SmartWindow software. The ML-7710 cards were configured for full-duplex, 100M-bit/sec operation, and used line-rate Ethernet frames in sizes between 64 and 1518 bytes to determine if performance was a function of frame size or rate.

For our Chariot testing, each workstation and server ran NetIQ's endpoint software to let Chariot generate and receive traffic. We used Chariot to create several streams of competing HTTP, FTP and Simple Mail Transfer Protocol traffic that were sent from endpoint to endpoint across the WAN link. We then created a policy for each type of traffic and monitored the streams to see how closely they matched the applied policy. During testing, we varied the bandwidth characteristics of each policy to better understand how QosWorks 10000 enforced these policies.

We also placed voice-over-IP calls across the congested link and tried to transfer files from a Win 2000 file server, with and without bandwidth policies, to add further realism to the tests.



## NetResults

### QosWorks 10000

**RATING: 4.15** **COMPANY:** Sitara Networks, [www.sitaranetworks.com](http://www.sitaranetworks.com) **COST:** \$25,000 **PROS:** Easy to install and use; great reporting features; provided effective bandwidth management. **CONS:** Some traffic difficult to classify; some confusing monitoring statistics; limited out-of-band management.

### Scorecard

	Performance 30%	Features 25%	Manageability 20%	Installation 15%	Documentation 10%	Total score
QosWorks 10000	4	4	4	5	4	4.15

**Scoring key:** 5: **Exceptional showing.** Defines the standard of excellence; 4: **Very good showing.** Although there may be room for improvement, this product was much better than average; 3: **Average showing.** Product was neither especially good nor exceptionally bad; 2: **Below average.** Lacked some features or lower performance than other products or than was expected; 1: **Considerably subpar,** or lacking features being reviewed.





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'Net Insider . Scott Bradner

## PART WAY DOWN A SLIPPERY SLOPE

It's long been rumored that some governments have sponsored research programs in cyberterrorism with the aim to disrupt networks and network-based services of enemies.



Now it seems some governments don't want to wait and may be ready to

use cyberterrorism weapons against some tiny targets today. According to Spiegel Online ([www.spiegel.de/netzwelt/politik/0,1518,126921,00.html](http://www.spiegel.de/netzwelt/politik/0,1518,126921,00.html)), Germany's Minister of the Interior Otto Schily has floated the idea of using state-sponsored cyberterrorism against non-German Web sites that Germany considers illegal. Minister Schily seems to have in mind using denial-of-service (DoS) attacks against U.S.-based Nazi Web sites.

(An aside: I used Google's language translation service at [www.google.com](http://www.google.com) to try to read the Spiegel Online article. I couldn't find a simple 'translate this URL' command, so I had to fake a URL that invoked the translation service with the URL that I wanted translated. I used the string "http://translate.google.com/translate?hl=en&sl=de&u=" followed by the URL. The output would not have gotten me a good grade in the last German language class I had, but I could mostly understand what was written. The translation had a few funnies, such as translating "American Constitution" as "American condition," but did a better job than I could have these many years after failing German at Boston University.)

Schily seems to ignore or dismiss some issues that are relevant. There is a

minor question of violating the sovereignty of another nation as well as Germany's own anticyberterrorism laws. There is the precedent that would be established — Germany could quickly find its own network under attack based on any number of imagined violations of local laws.

Would this stance justify an attack on the German banking system just because charging interest is against the law in some countries? How selective would the German tools be? If an official German DoS attack disrupted a legal site under German law, would that be seen as unavoidable collateral damage? Would a U.S. ISP that protects its infrastructure against a German DoS attack face charges of aiding an enemy in Germany?

As DoS protection technologies improve, Germany would have to develop better attacks to keep even. How could the country be sure its new attack technology wouldn't be analyzed and used against German targets? The attitude seems sort of like wanting to use chemical or biological weapons while assuming your own population can refrain from breathing for a few weeks.

This is a really bad idea. I trust people in Germany who are somewhat more in tune with international law and can see more than 3 minutes into the future will put a stop to it.

Disclaimer: Luckily, for every person at Harvard that has a really bad idea, there are more than a few to recognize it for what it is, but I've not consulted either for this column.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached at [sob@sobco.com](mailto:sob@sobco.com).*

**QosWorks,**  
continued from page 40

mine the effectiveness of policies as changes are made.

QosWorks has a Web caching component that reduces the demand on your WAN links. The feature worked well. However, because caching is integrated with bandwidth policies, it is difficult to exclude some sites from being cached without affecting bandwidth management.

QosWorks 10000 comes with command-line and Web-based interfaces. We found the Web-based interface to be more useful, especially with respect to the online help. The box can also be monitored via SNMP.

Access to the box is controlled by username and password. When logging on, we noticed a password prompt was returned only if a valid username was entered. This can be used to determine

the names of valid accounts. Additionally, there are no access control lists to prevent unauthorized connections to the management interfaces, but Sitara has informed us that this will be addressed in a subsequent update.

Documentation comes in several PDFs. There is also a small printed manual that describes the initial installation procedures. The majority of useful documentation can be found in the user guide covering the Web-based management interface.

QosWorks 10000 is a powerful and easy-to-use appliance for monitoring and managing your bandwidth. It could be just the thing for weary network managers and their stressed-out WANs.

*Griffin and Goddard are network engineers for Network Services at the University of Florida. They can be reached at [cgriffin@ufl.edu](mailto:cgriffin@ufl.edu) and [ggoddard@ufl.edu](mailto:ggoddard@ufl.edu).*

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# Technology Update

An Inside Look at the Technologies  
and Standards Shaping Your Network

## Ask Dr. Intranet

By Steve  
Blass

At our ISP, part  
of our network  
has a firewall  
with three Ether-  
net cards connected  
to separate net-  
works: the internal

network, the DMZ (demilitarized zone) and the outside network. The primary DNS server and mail server are in the DMZ. The secondary DNS server is connected to the outside network. We have a client who wants to set up Internet mail. We gave him a local IP address and put all the entries in our DNS server, but we can only ping the mail server on the inside network and can't do it on the outside.

Check whether your firewall is configured to handle ping packets. It may vary, depending on whether the client's mail server is connected to the inside interface of the firewall or to the DMZ interface. Use the "ns lookup" or "dig" command to find out what the outside Internet DNS server has recorded for your client's e-mail server host name. If your system lacks these commands, you can use a Web-based version at [www.analogx.com/contents/dnsdig.htm](http://www.analogx.com/contents/dnsdig.htm) to find where the outside DNS servers are sending your ping packets. The simplest approach to getting your client's mail traffic routed to the correct server inside your network may be to use a DNS MX (mail exchange resource) record to direct Internet mail bound for your client's mail server to your DMZ mail server. From there, your DMZ mail server should be able to route the client's mail to his mail server.

Blass, a network architect at Change@Work in Houston, can be reached at [dr.intranet@changeatwork.com](mailto:dr.intranet@changeatwork.com).

## Virtual routing promises new IP services

BY CURT NEWTON

Just as wavelengths were tied to physical fibers before dense wave division multiplexing, today routing is tied to dedicated physical routers that have earned a reputation as being expensive and complex to manage. To improve IP performance and maximize the physical router resource, layers of frame relay and ATM networking are often added to IP networks ([www.nwfusion.com](http://www.nwfusion.com), DocFinder: 3635).

To increase IP capacity, providers can install more physical routers at great expense and time — by adding new fibers before DWDM, for example — or gradually increase the size and speed of each physical router. The result is layers of costly equipment, slow provisioning and scaling barriers that block the potential of IP networking for today's enterprise users.

A new technology approach called dense virtual routed networking (DVRN) is designed to liberate the routing function from the constraints of monolithic physical routers that built today's Internet and private IP networks. DVRN promises to deliver improvements in scale and economies, and to enable a wealth of new IP-based services.

DVRN integrates three essential elements: dynamic virtual routing, optical-scale application quality of service (AQS) and collaborative service management.

With dynamic virtual routing, each virtual router is customizable and isolated from other virtual routers, allowing many virtual routers and virtual routed networks (VRN) to be supported in one system. Furthermore, each virtual router needs to support a full range of routing protocols, including Border Gateway Protocol 4 and Open Shortest Path First. And each dynamic virtual router must offer complete scalability, from a small private domain to the complete Internet route table.

Virtual routing is not a new concept, but DVRN bears little resemblance to the virtual router features available on a handful of systems today. These are largely limited by single-domain system architectures with just a customer-specific IP forward-

ing table, offering simple routing protocols, such as Routing Information Protocol, with small route tables.

These virtual routers are sufficient for today's low-end remote access and residential applications, but they lack the capabilities required for more demanding IP services.

DVRN's AQS is a transformation of quality of service beyond its traditional focus on reserving bandwidth for high-priority utilization toward enabling service over optical nets. AQS creates a new level of networking intelligence based on a highly granular and dynamic view of subscribers, applications, rules and statistics. AQS

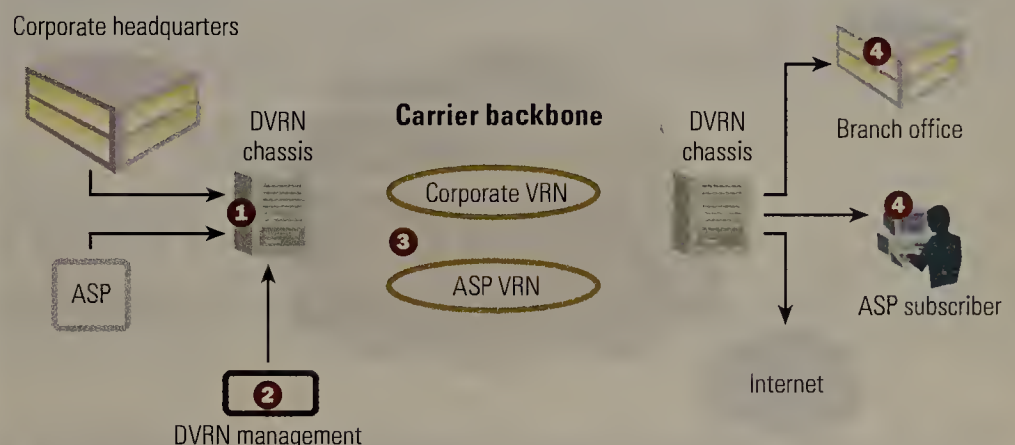
- It implements flexible and highly granular accountable entities that enable customized per-subscriber application-level service-level agreements and billing.

- It integrates secure and flexible partitioning among the different user roles in a VRN service environment, enabling end-user visibility and control, integration with service provider partners, and a full range of network operations center (NOC) and back-office tools and interfaces.

Once in place, a DVRN system is able to provide transparent network services to enterprise customers without interruption. Chassis-based DVRN systems are located in the service provider's points of

## HOW IT WORKS Dense virtual routed networking (DVRN)

DVRN can accelerate network operations and the delivery of IP-based services.



1 Multiple traffic streams from multiple companies are sent to the DVRN chassis in the metropolitan point of presence.

2 The DVRN management system provisions each VRN.

3 Optical-scale application QoS allows policy-based classification and queuing at wire speed.

4 Each VRN is isolated from the other VRNs and offers a full range of IP-based services, which are delivered to branch offices, partners and ASP subscribers.

enables a DVRN system to "sense" a packet's contents by looking into its structure and make dynamic classification, queuing and forwarding decisions based on stateful application awareness and subscriber/policy provisioning. DVRN enables this packet processing at wire speed on ports running at optical rates.

Finally, DVRN's collaborative service management component unifies and controls the powerful underlying DVRN technology and addresses key issues facing service providers:

- It utilizes policy-based flow-through provisioning to accelerate VRN service creation and activation, and break the move/add/change backlog.

presence (POP). These POP-based DVRN systems provide the dynamic virtual routing and AQS for each VRN. The collaborative service management software runs on servers in the NOC. It supports the full range of features needed to integrate effectively with operational support systems, directories, application services and NOC workflow processes.

The goal of DVRN is to liberate the routing function from the constraints of physical routers.

Newton is co-founder and senior director of product marketing at Crescent Networks. He can be reached at [cjnewton@crescentnetworks.com](mailto:cjnewton@crescentnetworks.com).

## Got great ideas?

Network World is looking for great ideas for future Tech Updates. If you've got one, and want to contribute it to a future issue, contact Features Editor Neal Weinberg ([nweinberg@nww.com](mailto:nweinberg@nww.com)).





Gearhead . inside the network machine . Mark Gibbs

## CHECKING OUT GEORGE'S, HEDDY'S INVENTION

**W**ireless is everywhere these days. Or rather, it isn't. Be that as it may, the desire to not to have to struggle with wires is high for anyone

who has ever installed a network.

But until recently, wireless products for the LAN environment were proprietary and rather pricey. All that changed

with the IEEE's 802.11b standard.

For details, there's an 802.11b primer from the Wireless Ethernet Compatibility Alliance, a consortium formed to

drive the adoption of a global standard (IEEE 802.11b) for high-speed wireless local area networking. The primer can be found at [www.wirelessethernet.org/downloads/IEEE\\_80211\\_Primer.pdf](http://www.wirelessethernet.org/downloads/IEEE_80211_Primer.pdf).

802.11b networks operate in the 2.4-GHz radio band using spread spectrum transmission. May we point out in passing that the actress Heddy Lamarr and composer George Antheil invented spread spectrum technology. On June 10, 1941, the unlikely duo received a patent for a classified communication system especially useful for submarines (see <http://web.mit.edu/invent/www/inventorsI%2DQ/lamarr.html>).

These networks support a maximum raw data rate of 11M bit/sec that can drop to 2M bit/sec when the signal is degraded.

Gearhead liked some of the 802.11 products tested. Our first products were Linksys' wireless access point, WAP11, which provides a link to a LAN, and wireless PC card, WPC11 (a Type II card). Linksys also supplied its PCI adapter, WDT11, but the one machine we wanted to try installing it on died the day the hardware arrived.

Linksys offers drivers for Windows 95, 98, NT, Millennium Edition and 2000, and the manuals step you through each installation screen you'll encounter. We installed the WPC11 under Windows 95 and 98, and it was straightforward.

After the inevitable reboot (we lost about one hour per week waiting for reboots after Windows software was installed or updated), we configured the card, which is pretty easy.

During installation, a control applet for the card is installed in the system tray that gives information on the link quality (signal strength and throughput) as well as the configuration options and security settings.

There are three key items on the applet's Configuration page: The "Mode" is "Infrastructure" if you are using the wireless access points or "Ad Hoc" if you only want a number of machines to operate in a private unwired network.

The service set ID (SSID) is the name of your network (all machines that are to communicate must agree on this name).

The "Use WEP" setting specifies the type of encryption to use, offering "Disabled," 128-bit or 40-bit. Use 40-bit if you're using the Linksys wireless access point because these devices don't support 128-bit encryption.

To complete the installation, we selected the Encryption page and entered the pass phrase for the WEP, or Wired Equivalent Privacy, key, which is used to encrypt the data exchanges.

We found the wireless PC cards easy to install, and next week we'll discuss the wireless access point setup and how our home is constructed — it actually does matter.

Send your thoughts along the wires to [gearhead@gibbs.com](mailto:gearhead@gibbs.com).

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## Editorial

### Here's a quiz: Can you name the top five ISPs?

If we're measuring access traffic — the delivery of bits to customers — the winner is UUNET, says Akamai CTO Daniel Lewin, who presented his findings at a recent conference on content delivery networks. That's not surprising because UUNET (now owned by

WorldCom) has been around for 13 years and is a pioneer in the development of the Internet.

The shocker is that in second place we have Excite@Home, which provides residential Internet access via cable modem. In third place, there's AOL. In fourth, another shocker — Road Runner. And in fifth, AT&T with its WorldNet Internet service.

These numbers say that @Home delivers more bits to its three million subscribers than AOL does to its 28 million. So one person on a cable modem is downloading more bits, based on real-world measurements, than 10 or 12 people on 56K bit/sec modems.

Lewin says if you gave everybody a cable modem today, "the Internet would burn down immediately, and all the routers would just catch on fire."

So the next time you're having trouble getting DSL or cable modem at your office or home, just keep telling yourself that you're saving the Internet from a meltdown.

Lewin made some other interesting observations about the state of Internet traffic today:

- Despite those dire predictions about a shakeout in the ISP business, there are actually more ISPs around than ever before: 7,000 and counting.

- That means Internet traffic is incredibly splintered. UUNET carries the most access traffic, and its share is only 6%. If you take the top 10 ISPs and add up their access traffic, it only comes to 25% of the total.

- Ever wonder what the capacity of the Internet is? According to Lewin, peak utilization of the Internet backbone is 200G bit/sec.

What's the scenario for the future of the Internet? The CDN vendors envision an "over-net" or overlay network on top of the Internet that basically takes the model of distributed computing and applies it to the Web.

Picture your corporate Web site mirrored in multiple locations around the globe, running applications, processing orders and delivering streaming media from all these points. No single point of failure. Faster response. It would be a neat trick if CDN vendors could pull it off.

— Neal Weinberg  
Features editor  
nweinberg@nw.com

Message Queue

## PATENTLY VALUABLE

Your article "Patent flap slows multilingual domain name plan" (www.nwfusion.com, DocFinder: 3822) states that if the start-up Walid does not agree to "license the patent for free to all interested parties ... the IETF will likely scrap this approach and start over, which could make Walid's patent worthless."

I obtained a copy of the patent (a PDF version can be downloaded from <http://table.jps.net/~busbyb/patents/06182148.pdf>) and looked at the IETF's proposed workarounds. While the IETF might be able to make one of the kludges work, Walid Tout's method has all the positive attributes of the original IETF proposal, and it would not be worthless, since it could be used within the extant DNS framework without interfering with other new schemes.

While this patent may cause gnashing of teeth at the IETF, it seems to represent an elegant way to go. It might be more useful for the IETF to investigate a reasonable licensing scheme than to dissipate its efforts on a workaround.

Bruce Busby  
Los Altos, Calif.

## NOVELL THOUGHTS

Regarding Dave Kearns' column "Pondering Novell's future" (www.nwfusion.com, DocFinder: 3823):

I recently attended my first BrainShare conference and came away feeling that Novell was a strong, vibrant company. I saw and heard nothing to justify Kearns' concerns. Novell has finally addressed some long-standing problems I had with its offerings. If new CEO Jack Messman can get out the message of just how comprehensive Novell's solutions are, the company will do quite well, thank you.

Bob Katcher  
Novell administrator  
Woods Hole Oceanographic Institution  
Woods Hole, Mass.

Regarding "Users give Novell a to-do list" (www.nwfusion.com, DocFinder: 3824):

Let's hope that Novell doesn't always listen to its customers, or listens very selectively in this case. The

advice to "distance itself from its legacy operating system" and "jettison development of products such as BorderManager and NetWare" would almost certainly lead to the company's demise. This reminds me of the advice to Software AG to neglect the development of Adabas and Natural in favor of developing middleware, advice that has led to that company almost disappearing off the map. Novell's strength lies in the diversity of its product range, and BorderManager and NetWare are essential pieces of the puzzle. NetWare is a vital foundation for the Net services software direction, while BorderManager is a classic example of exactly the sort of directory-enabled software Novell is being urged to write.

Novell has already killed too many products (for example, NetPublisher and ZENworks for Networks) to please critics. These were unique products that almost created new software categories before they were taken off the shelves. What Novell needs is not fewer products, but more effective marketing.

Russell Cohen  
Johannesburg, South Africa

"Distance itself from NetWare"? I don't think so! Unless Novell were to begin developing and supporting Linux, it would be a serious mistake for the company to abandon development of one of the few stable alternatives to the less-than-stable Windows NT/2000. Yes, Novell should pursue the development of NDS eDirectory, but it should not dump NetWare.

Wayne Heyward  
Richmond, Va.

## SURVIVOR, TOO

Regarding Chuck Yoke's column "Surviving a layoff and living to tell about it" (www.nwfusion.com, DocFinder: 3825):

Yoke put into words exactly how I felt, and sometimes still feel even now, almost 18 months after being laid off. I never thought, after giving a company 150%, that they would treat me like that. I've definitely lost a lot of respect for the corporate world. Fortunately, we work in an industry that needs IT professionals, with plenty of job openings.

Roland Wallner  
Norfolk, Va.

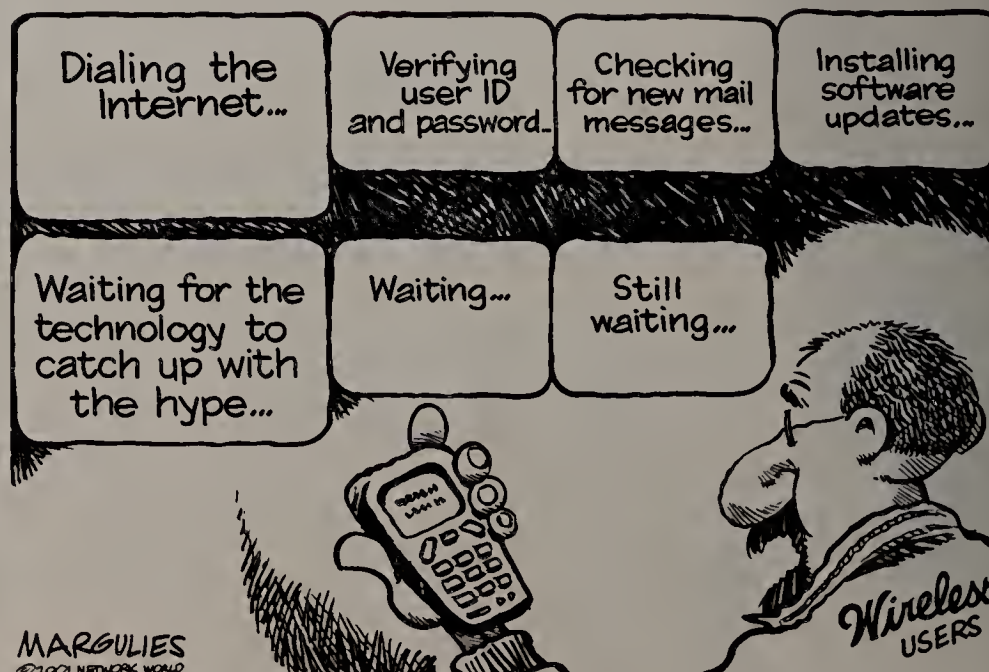
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## MAKE SURE YOUR PKI IS UP TO THE TASK

"Hi. I'm from Budapest. My company is called NetLock Uzleti Tanusitványkiadó Tanusitványkiadó. Would you trust me to secure your network?" The odds are you would answer "no" to such a query. But if you're running Microsoft's Internet Explorer, you trust the aforementioned company to certify the identity of your trading partners. Go ahead, look at your Internet Explorer preferences. You'll see NetLock in there as a trusted signer, right between Microsoft and Thawte. You didn't know you were trusting a company you never heard of, with a name you can't pronounce, in a country which, until a few years ago, was considered a part of the Evil Empire? Well, too bad for you.

The whole world of public-key infrastructure (PKI) has a Cold War feeling to it — trust, but verify. Trust a certification authority to sign certificates of strongly identified people, organizations and systems. Verify that those certificates were issued validly, that the identifications match up, and that they are still legal. But as the world discovered recently, all that PKI mumbo jumbo is poppycock

getting in the way of good old corporate profits.

Earlier this year, VeriSign mistakenly issued two code-signing certificates to someone claiming to be a Microsoft employee. OK, anyone can be conned. But it turns out that VeriSign doesn't include a pointer to its Certificate Revocation List (CRL), which would have told users the certificates had been revoked, in this kind of certificate.

But that's OK, because it doesn't matter anyway: Microsoft and Netscape Web browsers don't check the CRL when they see a certificate, so even if the pointer had been there, you wouldn't have been warned. Even if you ask the browser to verify, it doesn't check the CRL.

Security managers should use the Microsoft/VeriSign blunders as an opportunity to re-evaluate whether their PKI design is improving corporate network security or making life easier for the help desk. PKI requires more than just software: it's also a set of



policies and procedures for managing the entire life cycle of certificates. Are you simply concentrating on the front end of PKI and not looking at what happens when someone loses his private keys, changes job titles or leaves the company? Certificates can be used for encryption and digital signatures. Are you issuing certificates properly so they are only used for the

intended purpose? Learn a lesson from this error: Make sure your procedures for updating, distributing and checking CRLs are up to snuff.

I'd like to give PKI one more chance. Like any security tool, PKI can be misused and misconfigured to reduce security. However, the design of PKI can work, if you don't cut corners in the name of corporate expediency and are willing to pay the price that always comes with security.

*Snyder, a Network World Test Alliance partner, is a senior partner at Opus One in Tucson, Ariz. He can be reached at Joel.Snyder@opus1.com.*

## ARE WE RUNNING OUT OF WIRELESS SPECTRUM?

Recently I read with surprise an article in *The New York Times*' business section predicting doom and gloom for the U.S. wireless communications industry. According to the article, several studies submitted to the Federal Communications Commission by the Department of Defense and nonprofit and healthcare organizations indicate that it would be costly and almost impossible to relocate spectrum to accommodate new user



demand for broadband wireless. The article implies that we are running out of spectrum; therefore, broadband wireless may be a dead issue.

I find this hard to believe. In wireline communications we have exceeded theoretical bounds (30K bit/sec) to

drive copper wire to megabit speeds and will soon achieve gigabit speeds for short distances. I have no doubt that the wireless world will see technology and signal theory overcome the limitations of spectrum allocation.

Currently the mobile wireless world is trying to decide whether to forklift-upgrade to 3G technology or add-on-upgrade to 2.5G and then forklift to 4G. The bandwidth limitations of 3G are becoming self-evident, and the cost of a license plus the upgrade may not be economically feasible based on return on investment. However, with 4G it will be possible to achieve 2M bit/sec or greater bandwidth per mobile user in the same spectrum in use today.

While all the spectrum attention has been placed on mobile wireless, fixed wireless is also becoming a communications industry hot topic. The fixed wire-

less industry currently relies on expensive local multipoint distribution services technology, which uses licensed spectrum in the access WAN and IEEE 802.11 with frequency hopping to deliver speeds of 1M to 2M bit/sec to the wireless LAN.

Recent developments have produced speeds of up to 11M bit/sec (IEEE 802.11b), with the potential to get to 40M bit/sec (IEEE 802.11a) and eventually 100M bit/sec (IEEE 802.11a extended). These approaches use the unlicensed 2.4- and 5-GHz spectrums. Currently the 2.4-GHz spectrum is used for Bluetooth-embedded system communications and wireless home or office telephones, so there is potential for interference problems.

Two other fixed wireless standards — IEEE 802.16 for broadband wireless access and IEEE 802.15 for wireless personal-area networks (WPAN) — are changing the landscape of bandwidth delivery within current spectrum boundaries. WAN local-loop access using IEEE 802.16 in the unlicensed 2.4- and 5.8-GHz spectrum will deliver access speeds of 10M bit/sec or greater per user as a last-mile technology in competition with wireline xDSL. The low implementation cost of this standard, coupled with vendor use of IP and quality of service (QoS), make it a compelling option for wireless access for consumers and small office/home office users in the near term.

The WPAN using IEEE 802.15 is another story when it comes to spectrum utilization. Currently WPANs use Bluetooth at 2.4 GHz within a short-dis-



tance radius. However, they will use a new wireless communications technology called Ultra Wideband, currently in the approval process at the FCC. Ultra Wideband uses high-frequency microwave pulses with low-power intensity as a communications mechanism. Ultra Wideband transmissions cross all spectrum layers without interference, and as a security side benefit all transmissions are self-encrypted. Today, the distance cannot be great due to its low power, but per-user bandwidth speeds of 40M to 100M bit/sec can be demonstrated in the laboratory.

Ultra Wideband is a transmission technology that is not intimately tied to a media access control layer; therefore it has the potential of

being applicable to IEEE 802.11 and 802.16 with new coding and signal processing research. This lower-layer technology, coupled with the efficiencies of higher-layer IP and the guarantees of QoS, could meet user bandwidth demands over the LAN, WPAN and access WAN.

Ever-advancing research and technology is freeing us from the spectrum conundrum and its political side effects. We may be running out of allocated wireless spectrum, but not the ability to deliver broadband communications capability to a range of users throughout the U.S.


*Dzubeck is president of Communications Network Architects, an industry analysis firm in Washington, D.C.*



# Shopping for

**How to select your teleworkers**

BY STEVE JANSS



**T**he CEO just told the senior staff he wants a comprehensive teleworking plan on his desk by Friday. You're tasked with providing a comparative analysis of the pros and cons of each option, complete with costs. "Time is money" is as true for teleworkers as anyone else, and in the light of recent corporate IT meltdowns, you've got to get this one right.

Providing Internet access, complete with a specified quality of service (QoS) and firewall protection, for the corpo-

ration is one thing. It's only one point of presence, so you know exactly what's going on. However, providing it

for 250 teleworkers is quite another situation altogether, fraught with hidden costs and security problems you'll need to solve to make your corporation's teleworking endeavor a success.

#### And they're off...

Determining service availability is the first step in your analysis. If an option is not available, or fails to meet the corporate needs, it's a nonplayer. The players are many, and we'll break them out into three categories, based on their throughput. Category one — T-1; Category two — asymmetric DSL (ADSL), cable modem, ISDN, satellite (one-way or two-way) and wireless; Category three — ISDN and plain old telephone service (POTS), also known as "dial-up." Let's take a look at these in order of throughput.

POTS is available everywhere, but will cost you \$35 or more each month for a second phone line and an ISP account. Alternatively, your teleworkers can dial into your corporate remote access server, but studies show that while the security is increased with a RAS, it also costs about 50% more per teleworker than outsourcing to an ISP. The main benefit of a RAS is its QoS. By using high-quality modems, you can achieve at least a 28.8K bit/sec connection, even in poorer environments. Many ISPs average considerably less throughput during peak hours.

The downside of POTS is the time your teleworker loses waiting for a connection and coping with nonconnects and disconnects during periods of high use. The time that's lost can range between 5 and 30 minutes per day, costing your company \$130 per month. Add the additional time it takes to upload and download files and you begin to understand why choosing POTS will result in you paying your teleworker for long coffee breaks while they wait.

**TELEWORKING  
TOP 10**

**PART 2**

*An ongoing series designed to help set up your teleworkers for their small-office or home-office networks.*



**POTS**

**ISDN**



# speed

Net access without breaking the bank.

**ISDN** is an idea whose time has come... and nearly gone. It costs about \$150 to install and \$40 per month, but at 128K bit/sec, it's slower than comparably-priced alternatives. Its only saving grace is its two channels can also be used for data (at 56K bit/sec) and voice, making it a decent choice for small branch offices where bandwidth requirements may be minimal.

**ADSL** is the current rage. Unfortunately, "rage" often describes a customer's mental state after they've waited up to six weeks for the service only to spend another month ironing out the kinks. ADSL provides an average of 512K bit/sec download, and 128K bit/sec upload. It costs about \$40 per month, but the setup can range between \$0 and \$400, depending on your teleworker's location. Furthermore, if you're not less than 18,000 feet of the telephone company's switch, you're out of luck. Even then, many telcos are limiting installations to less than 15,000 feet due to the significantly higher number of problems associated with the "fringe" areas approaching 18,000 feet.

**Cable data service** is also available for \$40 per month, with setup fees between \$15 and \$100, depending on who installs the network card and who configures the computer. With throughputs rivaling ADSL, two-way satellite and wireless, a cable modem is an attractive option for the

Option	Average bandwidth (K bit/sec)		Average cost (\$)		Average three-year cost (x \$1,000)	Download bandwidth per three-year cost (K bit/sec/ cost x \$1,000)
	Download	Upload	Installation	Monthly		
<b>WildBlue (two-way satellite)</b>	3,000	3,000	\$350	\$90	\$3.59	836
<b>T-1</b>	1,500	1,500	\$300	\$700	\$25.50	59
<b>Cable modem</b>	512	128	\$45	\$45	\$1.67	308
<b>DSL/ADSL</b>	512	128	\$225	\$50	\$2.03	253
<b>Two-way satellite</b>	512	128	\$350	\$65	\$2.69	190
<b>Wireless</b>	512	128	\$1,250	\$125	\$5.75	89
<b>One-way satellite</b>	300	100	\$200	\$50	\$2.00	150
<b>ISDN</b>	128	128	\$120	\$30	\$1.20	107
<b>POTS</b>	28	28	\$50	\$20	\$0.77	36

teleworker. Although many have written about the problem of sharing the service with others, this is a bit of a misnomer. All users share Internet access. While it's true cable modem users are aggregated closer to the teleworker than ADSL users, thus magnifying local problems, there has been little reduction in throughput during periods of peak usage on some cable modems.

**Satellite data service** comes in two flavors: one-way and two-way. One-way service, such as Hughes' DirecPC ([www.direcpc.com](http://www.direcpc.com)), uses the satellite for the downloads and a phone line for the uploads, and costs about \$200 to install and about \$50 per month. Two-way service is still in the works, but expect Hughes and rival WildBlue ([www.wildblue.com/flash.htm](http://www.wildblue.com/flash.htm)) to use new satellites for uploads and downloads beginning early next year. Two-way satellite will be between 30% and 50% more expensive than the first, but you save a bundle on that second phone line, and promised up to a seven-fold increase in throughput.

**T-1** is the king of high-speed Internet connectivity for consumers. Unless your

teleworker needs the bandwidth for moving megabyte graphics or digital video, however, it's overkill. You'll pay for every bit per second, too, with an installation bill of about \$300 and a monthly bill of nearly \$700, give or take a few hundred based on location. Teleworkers who perform post-production digital video for everything from movie studios to local television stations are rapidly increasing, and their organizations are willing to foot the bill.

**Wireless local loop**, also known as "fixed-point wireless," is the latest entrant. Right now it's quite expensive, with typical installation fees topping \$1,000, and an average monthly charge of more than \$100, although its download and upload speeds compare favorably with cable, ADSL and two-way satellite. The big showstopper is that it's available in only a few metropolitan areas. However, because the repeaters can be mounted pretty much anywhere, it will soon reach further, and faster, than cable modem or ADSL. Companies such as NetBeam ([www.netbeam.net](http://www.netbeam.net)) and Cingular ([www.cingular.com](http://www.cingular.com)), formerly BellSouth Wireless Data, are well-suited to capturing these markets.

## ... Down the stretch

Each option has its pros and cons. What the CEO really wants to know, however, are answers to questions like "which option meets our service-level requirements for the least cost?" The above graphic, sorted in order of average download bandwidth, will help you answer that question:

To make a decision and determine the impact on your corporation's bottom line, fill in a blank chart with the options and prices available in your area ([www.broadbandcompass.com/](http://www.broadbandcompass.com/)). Make sure they meet your teleworkers' needs in terms of average throughput and features, without exceeding your maximum allowable total cost. Then, pick the option that will provide you with the highest download bandwidth per three-year cost.

*Next article: Firewalls and security — Why they're absolutely essential to protecting your teleworker, as well as your corporate environment. Go to [www.nwfusion.com/net.worker/index.html](http://www.nwfusion.com/net.worker/index.html) to read more teleworking articles.*

*Janss is the president of Jansys Information Systems, a consulting firm specializing in IS technologies for small businesses. He can be reached at [bizcom@jansys.com](mailto:bizcom@jansys.com)*



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**G**igabit Ethernet switch/routers offer blazing performance in basic configurations, but enabling a feature called link aggregation causes some devices' throughput to tank, latency to leap, failover to falter and quality of service to quit.

That's the major finding of an evaluation of these devices conducted by *Network World* Global Test Alliance member Network Test. Teaming with test equipment maker Spirent Communications, we pounded high-end switch/routers from Cisco, Extreme Networks and Nortel Networks with traffic representing more than 14,000 hosts — just the kind of loads these boxes might handle at the core of corporate backbone networks.

Foundry Networks and Avaya originally agreed to participate in our test, but failed to show up in the lab. Alcatel and Enterasys refused our invitation.

All these devices adequately move packets through one Gigabit Ethernet interface at a time. Gigabit Ethernet offers a fat pipe, but even that isn't enough for some enterprise networks.

Vendors say the way to burn through these bandwidth bottlenecks is link aggregation or "trunking," a means of combining up to eight interfaces to form a single, larger virtual pipe.

It's a good idea, but our results suggest there's still work to complete. In assessing basic trunking, failover and QoS capabilities, we found that link aggregation introduced as many problems as it solved. In the worst cases, configurations that worked flawlessly with single interfaces wouldn't work at all when we tried to repeat tests

# The trouble with trunking

**Our tests show that high-end switch/routers run lightning fast — until you set up trunking.**

BY DAVID NEWMAN,  
NETWORK WORLD GLOBAL TEST ALLIANCE

using trunking.

That's not to say our results were all bad news. Cisco's Catalyst 6509 handled most link aggregation tests far better than the other boxes. Some of the 6509's results with two trunks defined were better than with one. Our results suggest Cisco's device is up to the task of delivering vast amounts of bandwidth on corporate backbones, even with advanced features such as QoS enabled. While not all the 6509's numbers were perfect, the Cisco device easily earned the *Network World* World Class award in this round of testing.

It wasn't as pretty a picture for the Extreme and Nortel switch/routers, which were plagued by performance gremlins in many trunking

tests. The line-rate throughput normally seen in Extreme's devices plunged as low as 10% of line rate in some tests.

Nortel's boxes delivered generally satisfactory results in the tests completed, but couldn't complete other tests because features such as multiple concurrent trunks and Open Shortest Path First (OSPF) failover aren't supported.

## First things first

We conducted four sets of tests: baselines, link aggregation, failover and QoS capabilities.

Baseline tests tell us about a device's basic packet-handling capabilities. In these baselines (see how we did it, page 58), we measured throughput, latency, jitter and

packet sequencing.

The first measurement was throughput. Even when forwarding 64-byte packets — the most stressful condition — nearly all the test runs were perfect on the products tested with no packet loss when handling line-rate traffic. The exception is the Cisco 6509, which dropped about 6,000 packets at line rate (out of an offered load of nearly three billion packets). We backed off the load to 99.9% of line rate and the 6509 didn't drop any.

While we expected equally rosy results with large packets, that wasn't the case. In the 64-port configuration, Extreme's Black Diamond couldn't forward loads any higher than 94.6% without loss. Nortel's result is missing in action — we saw packet loss at line rate. Cisco's 6509 forwarded large packets at line rate without any loss.

The throughput numbers don't tell the whole story about packet loss. Cisco and Nortel brought in new 16-port Gigabit Ethernet line cards. Both vendors' cards are blocking, which means they can't forward line-rate traffic on all ports without packet loss.

In Cisco's case, the new card is nonblocking on up to 10 ports, while the threshold for Nortel's new card is eight ports. Both vendors achieved good numbers in this test by supplying enough cards so that they didn't need to use every port of every line card.

Both vendors noted that few production networks run at line rate. While this is true, there are other factors that make this argument dubious.

For example, TCP-based applications, which constitute 90% of all IP traffic, inherently try to use all available capacity for any data transfer. Thus, any time TCP connections try

## NetResults

### Catalyst 6509



**RATING: 4.50** **COMPANY:** Cisco, (408) 526-7208 **COST:** \$97,965 as tested **PROS:** Best link aggregation and QoS by far; a solid performer. **CONS:** Not quite line rate; 16-port cards are blocking.

### Black Diamond 6808

**RATING: 2.50** **COMPANY:** Extreme Networks, (408) 579-2800 **COST:** \$104,750 as tested **PROS:** High throughput; low latency with single links. **CONS:** Link aggregation seriously degrades performance.

### Passport 8610 Routing Switch

**RATING: 2.25** **COMPANY:** Nortel Networks, (905) 863-0000 **COST:** \$74,715 as tested **PROS:** Low price. **CONS:** Doesn't support multiple concurrent trunks; failover using OSPF.

#### Scoring key:

**5: Exceptional showing** in this category. Defines the standard of excellence; **4: Very good showing.** Although there may be room for improvement, this product was much better than average; **3: Average showing** in this category. Product was neither especially good nor exceptionally bad; **2: Below average.** Lacked some features or lower performance than other products, or than was expected; **1: Considerably subpar**, or lacking features being reviewed.

### ScoreCard

	Link aggregation 25%	Failover 25%	QoS handling 25%	Baseline forwarding 12.5%	Baseline latency 12.5%	Total score
Catalyst 6509	4	5	5	4	4	4.50
Black Diamond 6808	2	2	2	4	4	2.50
Passport 8610 Routing Switch	2	1	2	4	4	2.25

Individual category scores are based on a scale of 1 to 5. Percentages are the weight given each category in determining the total score.

Note: Installation performed by Nortel.



to concurrently move data on more than eight or 10 ports, blocking will occur. The network may still appear to be lightly loaded because most network management equipment samples utilization over some period of time.

What sampling techniques miss is that blocking will prevent a group of instantaneous bursts from using the maximum capacity of the wire. Thus, the instantaneous forwarding rates for these devices will be well below line rate.

### The waiting game

Delay-related metrics, such as latency and jitter, are just as important for delay-sensitive applications such as voice over IP or videoconferencing. Latency and jitter should be low and constant to avoid choppy application performance.

Fortunately, latency was a complete nonissue in our tests (see baseline latency graphic, right). Even the highest figures — around 100 microseconds for Cisco and Nortel in the 32-port mesh tests — are an order of magnitude below the point where the delay would disrupt any application.

Extreme's Black Diamond earns bragging rights with the lowest single latency number we recorded, just 5.9 microseconds with short packets in our eight-port test. However, Nortel's Passport exhibited less variation in moving from eight to 32 to 64 ports, and it achieved the lowest average latency of 11.8 microseconds with short packets across all tests.

As expected, latency rose for long packets, but not by much. Extreme again bagged the lowest single latency measurement with 27 microseconds in an eight-port configuration. Cisco's 6509 was the

most consistent across all three configurations, achieving the lowest average latency of 60.3 microseconds with long packets.

Jitter — the amount of variation in latency — also turned out to be low and consistent, for the most part. Nortel was the leader, posting jitter of 16.7 microseconds or less in all the 64-byte tests, and 101.6 microseconds or less in the tests with 1,518-byte packets.

Curiously, the Cisco and Extreme switch/routers posted higher jitter than average latency in at least one of the tests with 64-byte packets. The most prominent example is Cisco's

6509 with 32 ports, with jitter of 211 microseconds, which was more than double the average latency.

Jitter needs to climb into the millisecond range before having a noticeable impact on application performance. There is one case in which these numbers could be significant — in a large network comprising many switch/routers. Latency and jitter are cumulative.

A network of 100 switch/routers each adding 200 microseconds of delay will experience at least 20 milliseconds of delay. In that range, application performance could easily suffer.

The final event in our baseline tests checked for out-of-sequence packets. A device that reorders packets can be disruptive to connection-oriented protocols such as TCP, which rely on sequence numbers to verify delivery.

Fortunately, none of the switch/routers have a problem in this area, with only one exception, as all 14.5 billion packets forwarded in our baseline tests arrived in the same order. The exception was Extreme's Black Diamond handling 1,518-byte packets in the 32-port configuration. In that test, the Black Diamond reordered 27 of the 148 million packets it handled.

### Jinxed links

Link aggregation, also known as load sharing, inverse multiplexing and trunking, lets network managers

boost bandwidth on switch-to-switch connections by dedicating up to eight interfaces into one "virtual pipe." All the ports in the trunk share a single IP address, simplifying device management. Aggregated links also add redundancy.

Trunking introduces some downsides. As our test results show, aggregating multiple interfaces into a single link will degrade throughput and latency.

The vendors say their devices use complex algorithms to allocate trunking resources, but it seems these algorithms aren't as highly optimized as those that handle packets from single ports.

We saw big differences between the products in our single-trunk tests. First, no vendor achieved line-rate throughput, so trunking introduces at least some performance degradation. Second, Cisco's 6509 produced the paradoxical result of forwarding short packets at a higher rate without loss than long ones. This is counterintuitive because, everything else being equal, long packets should be much easier for the device to handle.

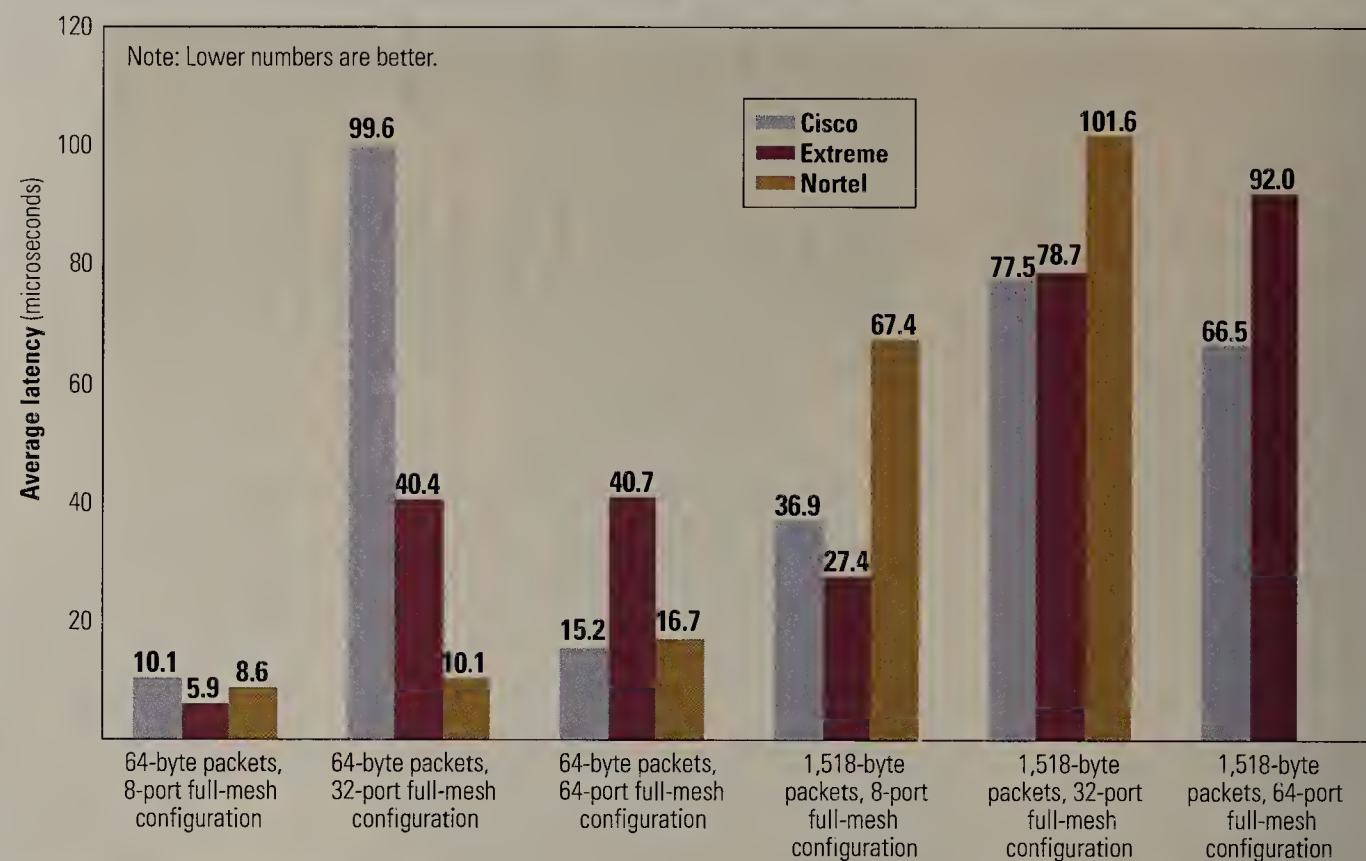
Link aggregation introduces two new variables to how a switch/router operates.

The switch/router is now charged with scheduling packets to get on the trunk and determining which physical interface within the trunk will carry the packets. Some algo-

See **Review**, page 56

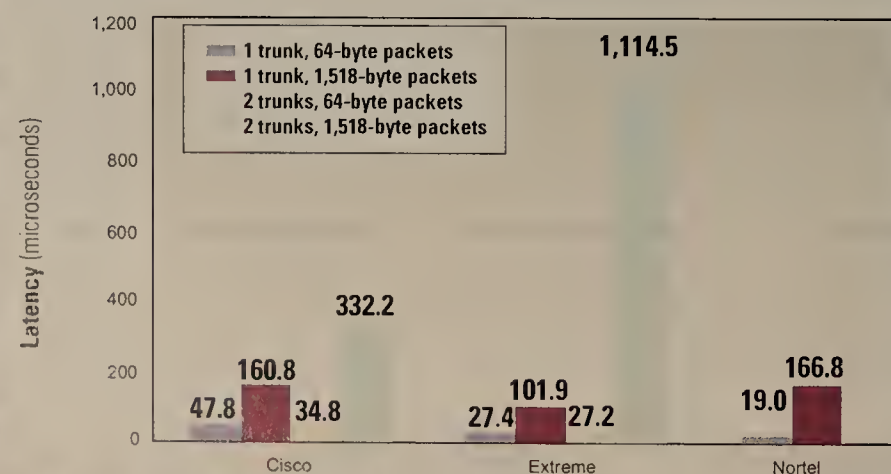
## Baseline latency

Extreme's Black Diamond achieved the lowest single latency measurement in our tests. But it's important to note that no device recorded latency that would significantly affect application performance.



## Link aggregation baseline latency

All devices recorded significantly higher latency with link aggregation than with single ports. However, even the highest delay isn't likely to impede application performance.

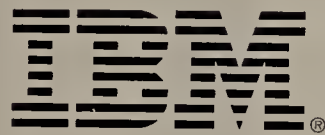




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Continued from page 54

rithms take longer to make these decisions for long packets than for short ones.

That's what we saw with Cisco's 6509, which achieved throughput near line rate with short packets, but hit just 93.6% of line rate with long packets.

Extreme's Black Diamond got the short-long order right, but that was little consolation because the switch's throughput with short packets was an anemic 36% of line rate. The Black Diamond offered users a choice of three packet-handling algorithms for trunking: round robin, port-based and address-based. If you experiment with different combinations of these, you'll find the best results come when you use the round-robin algorithm for the backplane and the port-based algorithm for the trunk.

Nortel's Passport 8610 achieved respectable throughput with short and long packets, giving it the best overall showing in the single-trunk test.

It was another story altogether for the test with dual trunks.

The Passport 8610 doesn't support this capability, while Cisco and Extreme support multiple concurrent trunks. Cisco's 6509 handled two trunks better than one, with throughput numbers around 99% of line rate for short and long packets. Conversely, Extreme's Black Diamond suffered more with two trunks than with one. In the worst case, its throughput with short packets is just 10%. Even with long packets, throughput was just 62% of line rate.

Trunking also has an impact on latency (see link aggregation baseline latency graphic, page 54). Cisco's delay with short packets tripled over its 64-port baseline result, and it shot up fivefold in the dual-trunk test with long packets.

Extreme's latency for long packets over dual trunks increased even more over the baselines, by 1,200%. These numbers are below the threshold where they'd disrupt application performance, but again, latency is cumulative over multiple hops — put enough trunks between client and server, and performance could suffer.

We also examined how switch/routers handled the addition or loss of a port from an active trunk. Ideally, a change such as this should have little impact.

In practice, two of the three switch/routers showed significant differences in forwarding rates

when the trunk configuration changed.

Nortel's Passport 8610 produced the most consistency in this test (see adding and removing ports from a trunk, below). However, Cisco's 6509 and Extreme's Black Diamond forwarded more packets when we added ports and fewer packets when we subtracted ports. This suggests the Cisco and Extreme devices respond faster to trunk configuration changes than the Nortel switch. Which is better, more consistency or higher peaks and lower troughs? You need to make your own trade-offs between predictability and speed.

#### Failsafe?

Our failover test examined how quickly the switch/routers moved traffic onto a secondary link on the loss of a primary circuit.

The two most popular failover mechanisms are the Layer 2 spanning tree protocol and a feature of Layer 3 OSPF called equal cost multipath (ECMP).

Spanning tree is known for its glacial cutover times. Even on Gigabit Ethernet links, it can take 60 seconds or more for traffic to begin flowing over a back-up link. For these tests, we asked vendors to use OSPF ECMP instead.

We ran the failover test in two configurations: Once with a single link between chassis, and again with an eight-port trunk between boxes.

Extreme's Black Diamond posted the best and worst results here (see failover times graphic, above right). With just one Gigabit Ethernet link

between the chassis, the Black Diamond cut over to the secondary link in just 0.31 seconds. But the Black Diamond struggled with the aggregated link, registering a cutover time of 2.53 seconds.

Cisco's 6509 produced nearly identical results with one link or eight between the boxes, taking only more than half a second in both cases. Nortel's single-link cutover of 0.51 seconds edged out Cisco's time, but its device doesn't yet support ECMP failover for trunks.

#### Class struggle

To see how well these devices prioritize traffic when congestion strikes, we set up a test involving three classes of traffic and two chassis connected over a congested link. First, we offered the three classes of traffic in one ratio (1-to-10-to-10 for the high-, medium-, and low-priority flows, respectively) and asked vendors to deliver the classes of traffic in a different ratio (2-to-12-to-7).

We then asked vendors to deliver the relatively small amount of high-priority traffic with no packet loss. Finally, we ran the test a second time, this time with no high-priority traffic. Here we offered equal

amounts of medium- and low-priority packets and asked vendors to deliver the traffic in a 5-to-3 ratio.

To achieve the second ratio, the switch/routers had to allocate bandwidth previously devoted to high-priority traffic to the medium-priority flows.

We did this as a check against static configurations that "nail up" fixed bandwidth allocations for each traffic class and prevent other classes from using bandwidth even when it's available.

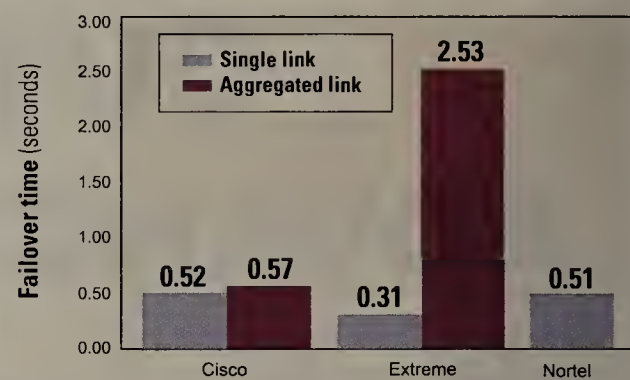
In addition to preserving some packets and junking others, we expected the switch/routers to mark the different packet headers' IP precedence fields to indicate the relative priorities of each traffic class.

To create congestion, we offered enough traffic to 21 interfaces on each chassis to present a 2-to-1

See **Review**, page 58

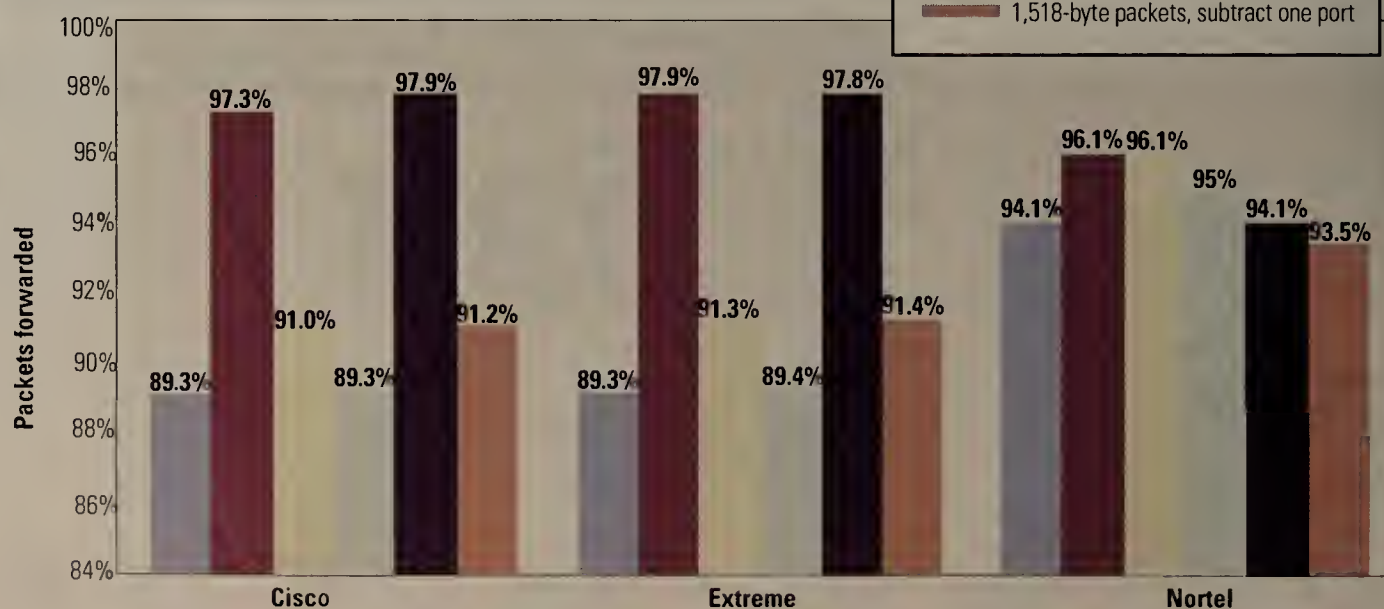
### Failover times

Cisco's 6509 exhibited little difference in single-link and trunk failover times. Extreme's Black Diamond took eight times longer to fail over with trunking. And Nortel's Passport doesn't support OSPF-based trunk failover.



### Adding and removing ports from a trunk

We measured how the products handle trunking changes. Nortel showed almost no change. But variations in the Cisco and Extreme tests indicate a faster response time to trunking alterations.







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overload on the link between the boxes. We repeated the QoS tests with a single Gigabit Ethernet link and a seven-port trunk between the two chassis.

Network Associates' Sniffer traces revealed that Nortel's Passport did not mark packets using IP precedence values but used Differentiated Services code points (DSCP), a traffic classification mechanism now being defined in the Internet Engineering Task Force. That's a commendable feature because it's likely that all vendors eventually will use DSCPs for Layer 3 classification. Unfortunately, Nortel says its switch/routers do not support classification using IP precedence levels.

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## SWITCH/ROUTER REDUX

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In the test with three traffic classes, Cisco's 6509 came closest to hitting our desired ratio of 2-to-12-to-17 among the different traffic classes. Cisco's ratio was 2.00-to-12.03-to-6.97, Extreme's was 2.00-to-12.28-to-6.72, and Nortel's was 1.99-to-11.88-to-7.13. All three boxes hit the ratio, but Cisco's result is closest by a few hundredths of a point. Cisco and Extreme also delivered the high-priority traffic with no packet loss, and Nortel's switch/routers dropped a paltry three high-priority packets.

Results differed more when we offered only two traffic classes. Here, only the Cisco 6509s achieved the desired 5-to-3 ratio. The Black Diamonds posted a 5-to-2 ratio and the Nortel boxes delivered in a 5-to-4 margin. These errant ratios suggest that when more bandwidth becomes available, the boxes will supply too little or too much low-priority traffic.

Things got worse when we attempted the same test with a seven-port trunk linking the boxes. Cisco's 6509 again hit its numbers dead-on: 2-to-12-to-7 but Nortel's ratio was 2-to-11-to-3 and Extreme's numbers were a lopsided 2-to-17-to-3. Clearly, the addition of link aggregation in the Extreme and Nortel switch/routers made it much more difficult for these devices to priori-

tize traffic when congestion struck. Additionally, the Extreme and Nortel gear dropped significant amounts of high-priority traffic: 7% for Extreme and 23% for Nortel.

It was much the same picture in the test with two classes. Cisco again breezed through, hitting the desired 5-to-3 ratio. Extreme and Nortel severely underfed the low-priority traffic delivering packets in a 5-to-1 ratio.

The lesson is that QoS and trunking can be a hazardous combination. Trunking introduces complexity as switch/routers need to do additional queuing on top of the buffering that QoS requires.

None of the devices we tested achieved perfect results across the board, but Cisco's Catalyst 6509 came the closest. This is especially true in the tests involving link aggregation, where the Extreme and Nortel devices couldn't cope in some events. If speed is the requirement, any of these switch/routers will do an adequate job. However, for more advanced configurations such as those involving link aggregation, fast failover and traffic prioritization, our results suggest that Cisco's Catalyst 6509 is far better suited than its rivals.

Newman is president of Network Test in Hoboken, N.J., an indepen-

dent benchmarking and network design consultancy. Network Test's clients include large firms, service providers and publications; to preserve its independence the company does no vendor testing. Newman is active in the IETF's benchmarking working group, and is co-author of a draft specification on network-layer quality-of-service mechanisms. He can be reached at [dnewman@networktest.com](mailto:dnewman@networktest.com).



Newman is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to [www.nwfusion.com/alliance](http://www.nwfusion.com/alliance).

## How we did it

We asked vendors to supply two switch/router chassis, each equipped with at least 32 1000Base-SX interfaces.

We ran baseline tests in configurations with eight, 32 and 64 interfaces per chassis. These tests involved fully meshed traffic, meaning all ports exchanged packets. We ran each test twice using two packet sizes: 64 and 1,518 bytes. Spirent created custom scripts that offered up to 224 unique IP source addresses to each switch interface. In the 64-port full-mesh tests, there were more than 14,000 addresses involved. In the baseline tests we measured throughput, latency, jitter and packet sequencing.

### Trunking

We asked vendors to link two chassis with one or more aggregated links. We connected the Smartbits to 32 interfaces on each chassis and offered traffic across the trunks. We began with a single trunk consisting of eight ports and reran the same tests with two trunks of eight ports apiece. The Smartbits represented 224 unique IP addresses per port. With 64 ports total on the test bed, there was traffic from 14,336 unique hosts involved. To examine how these switches handled the addition or loss of a port from an active trunk, we defined a seven-port trunk between two chassis. From each of 64 Smartbits card, we offered exactly enough traffic to saturate the seven-port trunk.

To test the addition case, we enabled an eighth port

in the trunk 10 seconds into the 30-second test duration. In the subtraction case, we began the test with eight ports in the trunk and removed one of these 10 seconds into the test. We repeated the three steps (baseline, add and subtract) with short and long packets.

### Failover

We offered traffic at a rate of 1 million packet/sec in each direction across a switch link for a duration of 60 seconds. Ten seconds into the test, we removed the primary circuit, forcing Open Shortest Path First to reroute packets over the back-up link. Determining cutover time was a matter of simple math: At rate of 1 million packet/sec, the switches would drop one packet for each microsecond between the failure of the primary link and the establishment of the secondary link. We ran the failover test in two configurations: once with a single link between chassis, and again with an eight-port trunk between the boxes.

### Quality of service

We set up a test involving three classes of traffic and two chassis connected over a congested link. We offered the three classes of traffic in one ratio (1-to-10-to-10 for the high-, medium- and low-priority flows, respectively), and asked vendors to deliver the classes of traffic in a different ratio (2-to-12-to-7). We also asked vendors to deliver the relatively small amount of

high-priority traffic with no packet loss. Then we ran the test a second time, this time with no high-priority traffic. This time we offered equal amounts of medium- and low-priority packets, and asked vendors to deliver the traffic in a 5-to-3 ratio. Vendors had to use the same configurations in both test runs. To create congestion, we offered enough traffic to 21 interfaces on each chassis to present a 2-to-1 overload on the link between the boxes. We repeated the quality-of-service tests with a single Gigabit Ethernet link and a seven-port trunk between the two chassis. In addition to preserving some packets and junking others, we expected the switch/routers to mark the different packet headers' IP precedence fields to indicate the relative priorities of each traffic class.

The complete test methodology is available at [www.networktest.com/1route/1routemeth.html](http://www.networktest.com/1route/1routemeth.html). Network World acknowledges the support of test equipment vendors who supplied key infrastructure and support for this project. They include Spirent Communications of Calabasas, Calif., which supplied its Smartbits 6000B chassis and 3201B Smartmetrics cards. Also, Brooks Hickman, a member of Spirent's technical staff, developed custom traffic scripts to run on the Smartbits. Network Associates of Santa Clara, supplied its Sniffer Pro 4.6 protocol analyzer for use in traffic monitoring. Fluke, of Everett, Wash., supplied its Fluke One-Touch cable tester, which we used in debugging test bed infrastructure.



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**The role of relationship manager is becoming vital for aligning business requirements with technology.**

BY JOANNE CUMMINGS

**AT** first blush, the relationship manager's role seems a bit too frivolous for most IT shops.

In the hard-charging world of e-commerce, when projects are turned around in Internet time and dot-com initiatives lay bloodied by the wayside, who has the time, the staff or the money to foster internal business unit relationships? Success goes to the lean and mean, right?

Wrong. Most organizations making successful e-business forays view relationship managers — or liaisons who can help corporate departments successfully navigate technology — as highly strategic weapons. The position is on the rise, and Gartner predicts that by 2003, 85% of companies will establish a formal relationship management program designed to help translate business requirements into IT initiatives.

"The e-business push makes it very apparent if the IT organization isn't in tune with the business," says Barbara Gomolski, a research director at Gartner. "The business groups want to move quickly, but they soon find they can't get the support or strategic assistance they need from IT."

This scenario calls for a relationship manager, but can also explain the true strategic importance of new projects to IT.

"For us, it's a two-way membrane," says Kevin Book, senior director of technology at Motley Fool, an online financial services company in Alexandria, Va., that has established a formal relationship management program. "With each new project, relationship managers need to properly escalate the cost concerns of the technology group, while at the same time effectively find the most relevant, strategic parts of the business plan to put in context for the technologists."

This helps companies avoid orphaned projects while reining in costs. Motley Fool's relationship management

group reports to finance and is responsible for performing cost/benefit analyses.

Finding a person with all the requisite skills is difficult. Most relationship managers have been with their company for years, understand the way the business works and have a strong grounding in IT. Relationship managers are executives who generally earn between \$75,000 and \$125,000 per year.

"They need to know the business and how to exploit technology, but they really need to be good communicators, negotiators and consensus builders," Gomolski says. "These are people who can rally support and build trust in others."

Michael Newcity typifies that complex skill set. He has performed a relationship manager role for the past year at ABF Freight Systems, although his formal title is e-commerce manager. Employed at the Fort Smith, Ark., firm for almost nine years, primarily within IT, Newcity has a double major in business administration and computer information systems and is working toward an M.B.A.

He finds the role all-encompassing at times.

"You're always in the middle," Newcity says.

"There is dependency on me for IT expertise, but I need to plan strategy and do research, at the same time I'm interfacing with others in the company. There's only so much one person can do."

If you're interested in becoming a relationship manager, consider the following advice:

- Don't take sides. Newcity walks a fine line between IT and the internal units. "Never talk down any side," he says. "Keep a positive attitude, and never point fingers."

- One way to avoid conflict is to ensure IT fully understands the business impact of a proposed project.

- Get business expertise. Formal education is a plus,

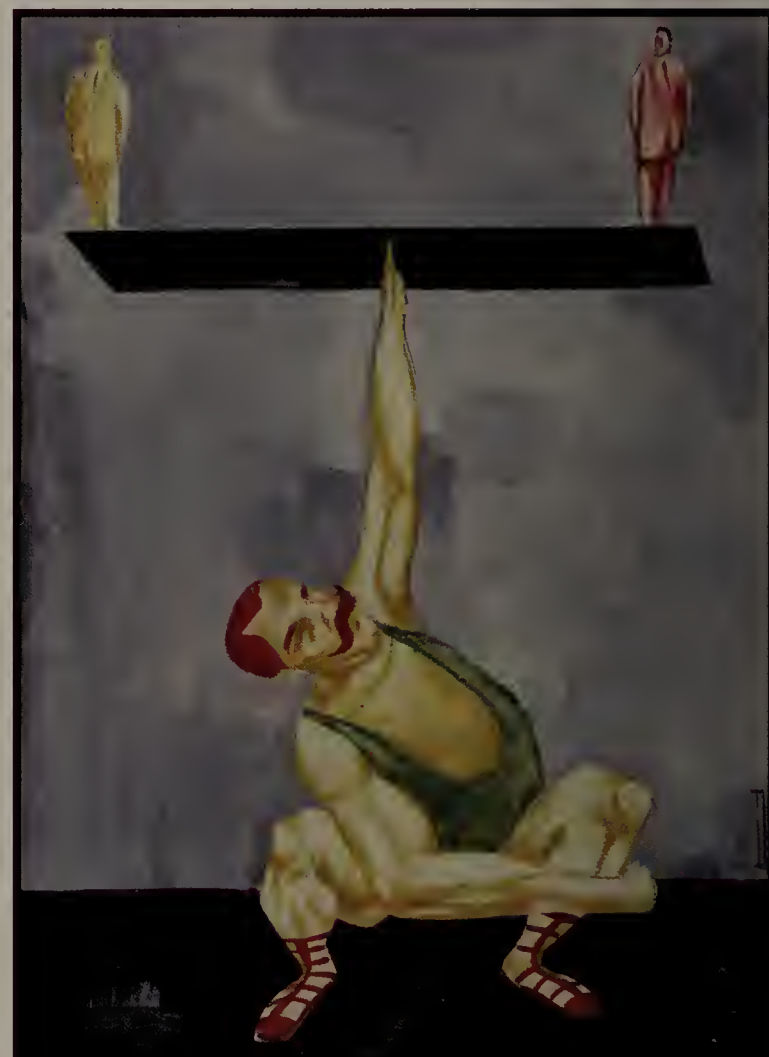


ILLUSTRATION: SCOTT LAUMANN

but IT types can gain even more business savvy by choosing a mentor who understands all the aspects of the company.

Gartner's Gomolski recommends actually moving into the business side. "Even if it means making a lateral move or doing something for only six months, it's a good idea to get some work experience in the business unit," she says. "You need to gain exposure to the business issues from their perspective."

- Listen. Motley Fool's Book says the first lesson a relationship manager learns is to listen. "It seems intuitive, but you'll find that once you're in the middle, there's absolutely a horrible disconnect between these two disparate groups," he says. "Listening and understanding the extent of the problem is the first step."

Newcity agrees. "Sometimes, IT is isolated from the competitive environment of the work they're doing for the business," he says. "They don't get a sense of the struggle or the importance, or the need to do the next project. That's why relationship managers are important."

Cummings is a freelance writer in North Andover, Mass. She can be reached at [jocummings@mediaone.net](mailto:jocummings@mediaone.net).

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## MIDDLE MANAGERS

White paper: The role of the relationship manager.

Core competencies: Research on skills required for the job.



### Relationship managers at a glance

**JOB DESCRIPTION:** Acts as liaison between IT and general business units; helps business units capitalize on technology.


**COMMON TITLES:** Relationship manager, business consultant, internal consultant, business liaison, program manager.

**SALARY RANGE:** Typically \$75,000 to \$125,000.

**REQUIRED SKILLS:** IT, business, negotiations, communications, consensus building, trust building.

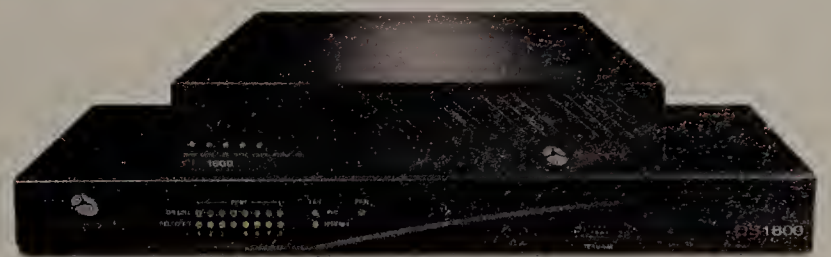
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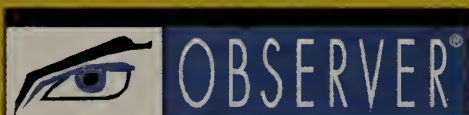
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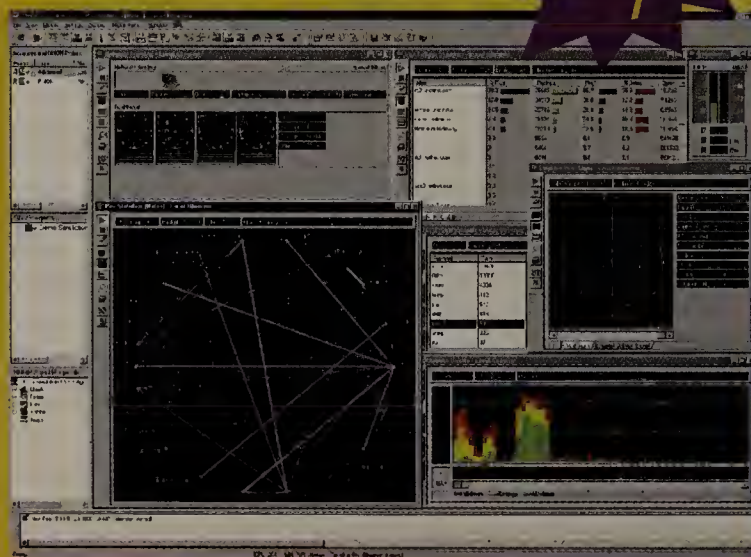
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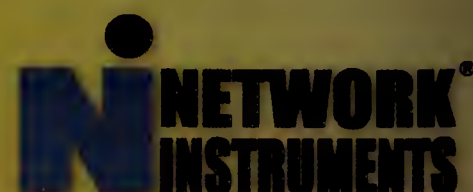
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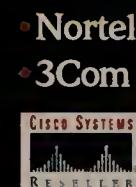
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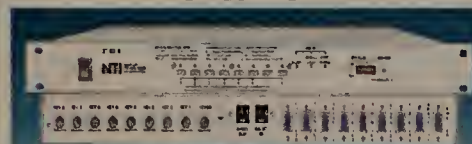
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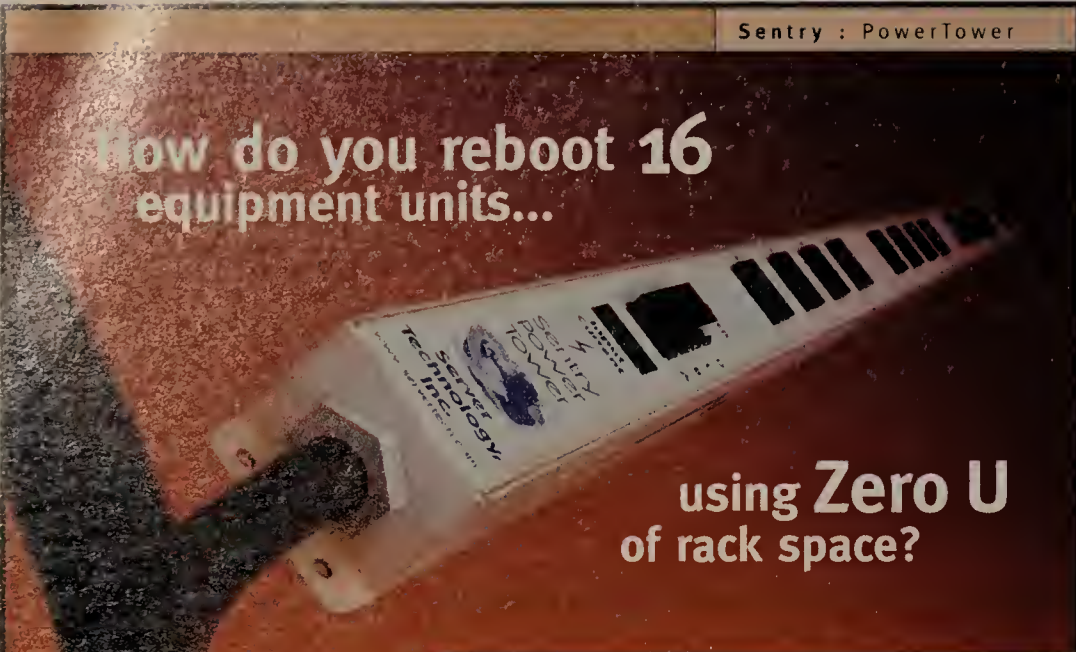
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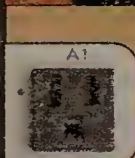




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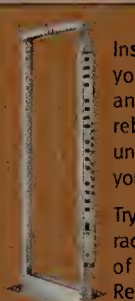
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Minimum educational requirements include a Bachelor's degree in Computer Science, or Math / Engineering with CS coursework. Minimum experience required is three (3) years device driver design and development in the MS Windows (9x or NT) environment, to include involvement in at least two (2) full product cycles. Specifically required is the demonstrated ability to develop driver software using MS Visual C++, and to debug it with a kernel-mode debugger. Also required is the demonstrated ability to optimize code efficiency by assembly language programming on X86-family processors. Additionally required is the demonstrated ability to design, implement, and debug MFC-based Windows user interface elements and applications. Finally required is the demonstrated ability to program 3-D polygonal and NURB curve / surface representations and algorithms; polygonal object collision detection algorithms; and triangle-based graphics rendering pipelines. Starting salary is \$82,200 per year, together with 75% medical and dental, full life and disability insurance, three weeks paid vacation, and other industry-competitive benefits.

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An international consulting firm is seeking. Programmer Analyst. Software Engineers and Database Administrators. Exp with a variety of hardware and software packages. We offer a competitive salary, commensurate rate with exp., plus a comprehensive benefit package, including 401K, health, dental and education assistance/reimbursement. Send resume to: Primesoft, LLC, One Lawson Lane, Burlington, VT 05401. Tel: 802-658-7600 / Fax: 802-658-1090 Email: [recruiting@primesoftgroup.com](mailto:recruiting@primesoftgroup.com)

Bahwan Cybertek Technologies, Inc. has several openings available for Prog/Sys Analysts, Soft. Engrs/Consultants, Proj Mgrs, DBAs, and Sys Admins to design / develop applications using skill sets such as: C, C++, VB, VC++, Java, EJB, Oracle, Informix, Sybase, UML, Internet, telephony and wireless technologies. Windows/UNIX admin. Require BS/MS or for. equiv in Comp Sci/Engg (any branch) /Sci/Math/Bus or related field. Combination of edu and exp will be accepted. Highly competitive salaries & benefits. Travel/relo required. Resumes to, Suite 215, 209 West Central Street, Natick, MA 01760.

### INFORMATION TECHNOLOGY OPPORTUNITIES



The Gillette Company is the world leader in more than a dozen consumer product categories. Global World Class operations are increasingly dependent on Information Technology. Exciting opportunities exist in global business process integration initiatives. We are currently seeking the following highly qualified professionals to join the Gillette IT team in the Boston area.

The following positions (unless otherwise noted) all require a Bachelor's degree (or equivalent) in Computer Science, MIS, Business Admin., or similarly relevant field, and 3-5 years relevant experience to include the requirements described below.

- **Senior Staff Programmer Analyst** with 5 years business systems programming experience, 3 years of which involved SAP ABAP development, with design and OA expertise, and SOL/relational databases. [ Job Code #: IMSP-DL-1CP ]
- **(SAP) Staff Basis Administrator** with 3 years IT experience defining requirements and maintaining SAP Basis infrastructure, with SAP remote printing, HP-UX, and EMC hardware/software. [ Job Code #: IMSP-DL-100008CP ]
- **Senior Telecommunications Analyst** with Associate's degree, 3 years experience in design and implementation of multi-carrier global networks using Cisco hardware and software. [ Job Code #: IMSP-DR ]

Starting salaries range from \$53,700 to \$96,400 per year, together with paid vacation, medical, dental, life and disability insurances, and other industry-competitive benefits.

Please mail / email resume to: The Gillette Company, Prudential Tower Building, Human Resources (Mailstop JM-IMSP), Boston, MA 02199. Email: [JM\\_IMSP@Gillette.Com](mailto:JM_IMSP@Gillette.Com).

The Gillette Company is an equal employment opportunity employer.

**Application Architects:** Will work in distributed application and complex database environment. Will customize, deploy and establish support models for proprietary eBusiness solutions. Will deploy applications servers and customize software applications. Will work with complex database architecture and web-based solutions. Will work with various eBusiness integration techniques including XML, distributed application and database servers employing Oracle Enterprise and SQL Server. Will employ Visual C++, Visual Basic, Java, NT UNIX, Solaris and Windows 98/2000. Will also utilize enterprise and departmental applications such as Peoplesoft, Bluestone, or Siebel. Requirements: Bachelor's Degree in CS, EE, Math, Statistics, or related and five (5) years of experience in the job offered or five (5) years of experience in any IT or Computer related field. Work experience must be progressive. Also, demonstrated expertise using enterprise or departmental applications such as Peoplesoft, Bluestone, or Siebel; using Oracle7.X, SQL, or XML; and working in distributed application and complex database environment. Offered salary is \$73,500/year for full-time employment (min. 40 hours per week) and standard company benefits. (Multiple Openings). EEO. Submit 2 resumes and respond to Case No. 20011587, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114.

**Senior Development Engineers:** Will customize support models for eBusiness solutions, design and using UML. Working in a distributed software development environment, will deploy and establish customized solutions using Java, C++, J2EE, XML, and the most recent development tools. Will also develop solutions for Oracle, SQL Server and DB2 databases. Specific responsibilities will include development of complex web applications, including designing, programming, data modeling, testing, and implementation. Requirements: M.S. in CS or closely related field and two (2) years of experience in the job offered or two (2) years of experience in the related occupation of Software Development OR B.S. in CS or closely related field and five (5) years of progressive work experience in the job offered or the related occupation of Software Development. Also, demonstrated expertise using J2EE and XML, in UML design or database modeling, and working in distributed software development environments. Offered salary is \$73,500/year for full-time employment (min. 40 hours per week) and standard company benefits. (Multiple Openings). EEO. Submit 2 resumes and respond to Case No. 20010910, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114.

#### SOFTWARE ENGINEER

Synapse- an independent marketer of subscription services is seeking a Software Engineer to define and ensure integrity of the software development and implementation architecture, perform final code reviews, test, develop, implement and maintain standard software development processes; and define appropriate technology infrastructure and programming interfaces (API's) to core business systems.

Qualified applicant should hold Bachelor's degree in Computer Engineering or related field and have 3 years of relevant experience. Excellent compensation and benefits. Send resume with salary history to: Synapse Group, Inc., HR Dept., P.O. Box 16919, Stamford, CT 06905, Fax (203) 329-7020. Visit our website: [www.synapsegroup.com](http://www.synapsegroup.com). EOE M/F/D/V SYNAPSE

**SOFTWARE PROFESSIONALS** Cogniant, Inc., a NY based IT Co. has positions available for software professionals - job sites throughout the U.S. Programmer Analysts, Software Engineers, Systems Analysts and Technical Recruiters wanted with hands-on exp. using Java, Unix, Visual Basic, Oracle, C, HTML, SOL. C++ , Developer 2000, Windows NT , Small Talk. Send resume to: HR Dept., Cogniant, Inc., 32 Broadway, Suite 1414, NY, NY 10004

Champion Mortgage Co., a Financial services Co. in Parsippany, NJ seeks Programmer Analyst with 4+ years of experience in analysis, planning, developing, testing & documenting application software using RPG/400, RPG IV, CL/400 and DB2/400 on IBM AS/400 platform. Should have good knowledge of technical support and system operations. Knowledge in VBA, ASP, Java, Informix server a plus. Candidate should be able to install, configure and set up change management system ALDON and other tools independently. BA or higher in Computer Engineering or Electronics Engineering. Respond by resume to: HR Dept., Champion Mortgage Co., 2 Gatehall Drive, Parsippany, NJ 07054.

Cinoni, Inc. (f/k/a i-cubator, Inc.) currently has openings for Chief Technology Officer, VP of Technology, Director of Technology, Business Analysts. Please fax resumes to 617-266-6776 attn Nancy Walls, email to [careers@cinoni.com](mailto:careers@cinoni.com) or mail to Cinoni, Inc., 40 Court St., Boston, MA 02108. Visit our website at [www.cinoni.com](http://www.cinoni.com)

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Project Manager. \$40.00 Per Hour. Job Duties are as Follows: Responsible for managing large scale software projects for Safesource Corporation and its clients that involves several vendors and consulting companies. Specific job duties include: project planning & management; risk assessment & management; project execution methodology creation and maintenance; supervision of team members; monitoring progress of project tasks; prepare status updates for management review; provide technology and management vision to project; and provide technical input to project tasks such as data migration, database development, and package customization. Requires M.B.A. or a M.S. degree in MIS or Management. The applicant must possess demonstrated ability to lead and manage large-scale software implementation projects as evidenced by at least 6 months of supervisory experience in a software development and database administration position. Send resume to Safesource Corporation, 10900 Wittenridge Drive, #C-3, Alpharetta, GA 30022, USA with proof of legal authority to work permanently in the United States.

Sr. Programmer Analyst sought by pharmaceutical research and development company in Plainsboro, NJ. Must have a Bachelor's degree in MIS or Comp. Sci. Knowledge of HTML, JavaScript, PL/SQL, Visual Basic, C, C++, SAS, COBOL 85 languages and NetObjects Fusion applications required. Send resume to: Sheila Connelly, Director H/R, Bristol-Myers Squibb Co., P.O. Box 4000, Princeton, New Jersey 08543. Job Code #B12.09

Programmer Analyst for Lansdale, PA comp. consulting firm. Respons. incl.: system analysis, design, develop., implement, client interface & documentation of business apps. Write & modify new programs, create/interface w/ databases, test sys. for final production implementation. Lay out test plans & carry out system tests. Implement systems in production after completion & develop data conversion utilities for Databases involved. Develop other programs as reqd. Complete on Unisys A series/Clearpath mainframes using LINC Cobol DMSII, DMSII, WFL & System Utilities. Reqs: Bachelor Elec. Eng., Comp. Eng. or Eng. Computer Sys. w/ 2 yrs exp. in job offered or as appl. analyst or prog. analyst 40 hrs per wk, mon.-fri., 9am-5pm. salary \$81,200/yr. must have proof of legal authority to work in the u.s. report/submit resume to: job order # 6033053

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Phila., PA 19123

#### Programmer

##### CHIEF COMPUTER PROGRAMMER

Synapse - an independent marketer of subscription services is seeking a Chief Computer Programmer to work with programming, design, and project management personnel on development projects. Play a lead role in design, development, testing, implementation, and support of Internet and other MIS applications working in HTML, PL/SQL, ASP, Oracle & Java.

Qualified applicant should hold a Master's degree in computer science or related field plus 2 years of relevant experience. Excellent compensation and benefits. Send resume with salary history to: Synapse Group, Inc., HR, P.O. Box 16919, Stamford, CT 06905, fax (203) 329-7020. Visit our website: [www.synapsegroupinc.com](http://www.synapsegroupinc.com). EOE M/F/D/V

#### SYNAPSE

Programmer Analyst for Lansdale, PA comp. consulting firm. Respons. incl.: system analysis, design, develop., implement, client interface & documentation of business apps. Write & modify new programs, create/interface w/ databases, test sys. for final production implementation. Develop data conversion utilities for Databases involved. Develop other programs as reqd. Complete on Unisys A series/Clearpath mainframes using LINC XGEN Cobol DMSII, DMSII, WFL & Progress on Unix systems. Reqs: Bachelor Elec. Eng., Comp. Eng. or Eng. Computer Sys. w/ 2 yrs exp. in job offered or as appl. analyst or prog. analyst 40 hrs per wk, mon. - fri., 9am-5pm. salary \$81,016/yr. must have proof of legal authority to work in the u.s. report/submit resume to: job order # 7066190

The Phila. Job Bank  
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Phila., PA 19123

#### SYSTEMS ANALYST (Multiple Openings)

Analyze & evaluate existing or proposed software systems. Dvlp., implement & improve programs, systems & related procedures to process data using in-depth knowledge of the software dvlpmt. life cycle. Encode, test, debug & install operating programs & other system software utilizing knowledge of RDBMS environments & programming languages. B.S. (or equivalent) in Comp. Sci., Math, Engrg., Business or Commerce plus 2 yrs. experience in position offered or as Programmer Analyst or Software Engr. rqd. Must be proficient in Oracle or Sybase RDBMS environments; & in Java or Cobol or PL/SQL programming languages. High mobility preferred. 40 hrs/wk, 8 am - 5 pm, \$62,561/yr. Qualified applicants report/submit resume to: Barbara Cole, Supervisor, Greene County Team PA CareerLink, 4 W. High St., Waynesburg, PA 15370-1324. Refer to Job Order No. WEB163375.

### Computer Programmer/Analyst

Seeking highly motivated individuals for our product development team in Marlborough to develop and maintain company product data model including tables, elements, relations and keys. Develop process models for new product functs. & models. Develop on-line documentation, enhance existing functs. & screens for company products. Play a leading role in design, development, testing, and implementation, and management of various computer programs for analyzing data files or providing survey support services. BS/MS in CS or related field. Multiple openings available. Forward resumes to Neeraj Sharma, WALTCH 199 Forest Street, Ste. 300, Marlborough, MA 01752, Fax (508) 460-8848.

### Software Engineer

Perform solution development, requirements analysis, research, design, implementation, testing and maintenance of custom solutions of client server based information systems using Visual C++, MFC, Active X, COM/DCOM, API in a Windows NT/95 platform. Require 1 yr exp. in job offered or 1 yr exp. in Software Development. MS in Computer Science, Engg., Math or related field. Will accept BS degree plus 5 yrs of exp in the computer field in lieu of MS degree. Work requires traveling to various unanticipated locations throughout the US. Salary is \$78,000/yr, 40 hrs/wk, 8:00 to 5:00 p.m. Send two copies of resume to Job Order # 20010055, Labor Exchange Office, 19 Staniford St, 1st floor, Boston, MA 02114.

Worldwide Trade Resources, Inc., a prof. mgmt svcs. co in NYC, is seeking to fill the following positions:

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SOFTWARE ENGINEERS  
MS plus 3 years related work exp. & BS in Comp Sci, Engg, or related field & min of 5 yrs related work exp.

• Visual Basic • Java • PeopleSoft

Mail res and cov letter to HR Dept, WTR, Inc., 350 Fifth Avenue, Suite 720, New York, NY 10118.

Senior Systems Analyst wanted for Mortgage and Banking company in Florence, SC. Analyze test and modify OS/390 operating system software; specify hardware & software criteria; & supervise development testing and implementation of new software modules interfacing with CICS and TCP/IP. Must have 4 years exp. or Associate's degree in lieu of 2 years exp. plus 2 years exp. Respond to: HR Dept., Fleet Mortgage Group, Inc., 2210 Enterprise Drive, Florence, SC 29501.

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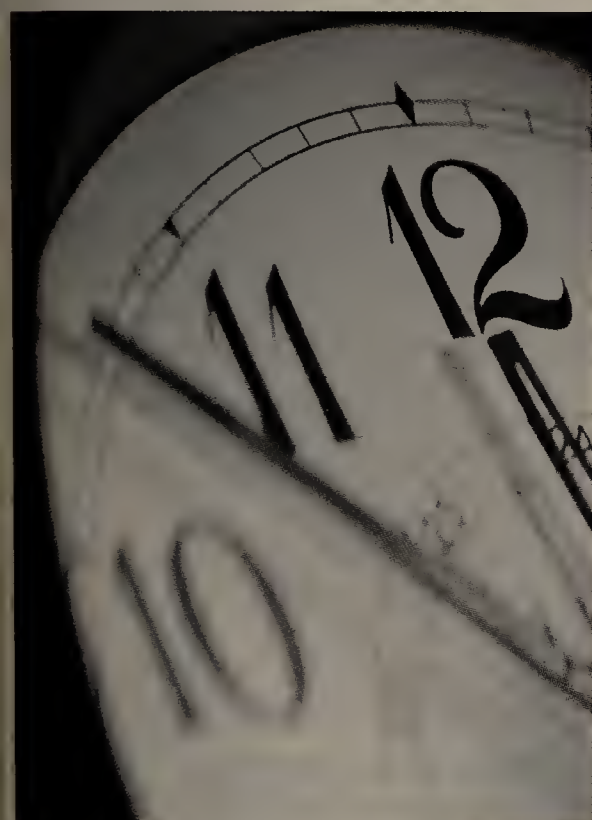
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Manager Software Research and Development sought by Securities Trading firm for Minnetonka, MN office. Must possess M.S. degree or equivalent in Computer Science or Engineering and 2 yrs. exp. in software development, design/computer programming. Respond to: Human Resources Department, Knight Trading Group, Inc., 525 Washington Boulevard, Jersey City, NJ 07310.

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Software Engineer sought by company specializing in business software solutions in Denver, CO to work in Denver & other unanticipated job sites in the U.S. Design and develop software applications and/or software tools that incorporate client/server architecture and interface with a variety of relational database management systems, and are platform independent. Analyze requirements. Create designs and design documentation. Code, test, and de-bug the software applications. Engage in project management as required. Use object oriented programming techniques and programming languages C/C++, and JAVA in the development process. Requires Bachelor's in comp. sci. or related field (incl. elec'l &/or elec'cs eng.); Working knowledge of designing and developing software applications using object oriented programming techniques. 8am-5pm, M-F; \$66,100/yr. (2 openings.) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number JL1117959.

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"MANAGEMENT ANALYST - ANALYZES BUSINESS PROCEDURES & PROBLEMS OF COMPANY'S ORDER ENTRY, INVENTORY & COST CONTROL, & PLANNING TO DEVISE THE MOST EFFICIENT METHODS TO ASSIST MANAGEMENT IN ACCOMPLISHING WORK. CONVERTS ANALYSES TO PROGRAMMABLE FORMS FOR COMPUTER USE. STUDIES DATA HANDLING SYSTEMS. DEVELOPS NEW SYSTEMS FOR MANAGEMENT TO IMPROVE WORK FLOWS. CONDUCTS ANALYSES OF MANAGEMENT & OPERATIONAL PROBLEMS. FORMULATES MATHEMATICAL OR SIMULATION MODELS OF PROBLEMS FOR SOLUTIONS BY COMPUTERS. BS DEGREE, COMPUTER APPLICATIONS OR INFORMATION SYSTEMS. 40 HR / WK. \$36.45/HR. TEE TOP OF CALIFORNIA INC. 5623 PECK RD, ARCADIA CA 91006."

Sr. Software Engineer - research, design, and develop computer software systems, especially 4GL-based modifications to the Symix ERP solution. Test software/hardware configurations, assist in implementing a SDLC. Analyze software requirements to determine feasibility of design within time and cost constraints. Must have BS in Computer Science and 4 yrs. exp. Send resume to Niagara LaSalle Corp., HR, Dept. 1412 150th St., Hammond, IN, 46327

Programmer Analyst sought in Arlington Heights, IL computer consulting comp To work in various unanticipated locations throughout the U.S. Plan, develop, test and document computer programs including client server application. Analyze client requirements to determine software modification requirements. Implementation of software projects; writing batch files. Use of IBM Mainframe, COBOL, CICS, and VSAM. Reqs. Bachelor's or foreign equivalent in Computer Science, Computer Engineering or Mathematics. Will accept three years of college education and three years of related experience in lieu of required education and experience. Plus 2 years in the job offered or 2 years in a related occupation including Programming or Software Engineer. Related experience must include writing batch files and use of IBM COBOL, CICS, and VSAM. \$61,921.80/year, 40 hrs/wk, 9:00AM-5:00PM. Applicants must show proof of legal authority to work in the U.S. Respond by resume to: Illinois Department of Employment Security, 401 South State St. - 7 North, Chicago, IL 60605, Attention: Shella Lindsey, Ref. # V-IL 24988-L "an employer paid ad". No calls - send 2 copies of both resume & cover letter.

Software Engineer. Sought by Englewood Colorado consulting company to work in various unanticipated locations throughout the U.S. To work in various unanticipated locations throughout the U.S. Research, design and develop computer software systems in conjunction with hardware product development. Analyze software requirements to determine feasibility of design within time and cost constraints. Consult with clients to define needs or problems. Use of Power Builder, Sybase, J BUILDER, JAVA, SERVLETS and HTML. Reqs. Master's Computer Science, Computer Engineering or Electronics Engineering or related field of study. Plus 3 years in the job offered or 3 years in a related occupation including Programmer Analyst. Will accept a Bachelor's degree and five years of progressive experience in the field in lieu of required education and experience \$72,000/year, 40hrs/wk, 8AM-5PM. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 and refer to Job Order No. JL1118068CO 4647489.

Software Engineer. Sought by Denver Colorado consulting company to work in various unanticipated locations throughout the U.S. Research, design and develop computer software systems in conjunction with hardware product development. Analyze software requirements to determine feasibility of design within time and cost constraints. Consult with clients to define needs or problems. Use of IBM 3090, COBOL, NATURAL, ADABAS, DB2, FileAid, TSO, ISPF, ACCESS and IOF. Reqs. Masters or foreign equivalent in Computer Science, Computer Engineering, Electrical or Electronics Engineering or Physics or related field of study. Plus 2 years in the job offered. \$75,000/year, 40hrs/wk, 8AM-5PM. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 and refer to Job Order No. JL1118067

SOFTWARE QUALITY ASSURANCE ENGINEER/PROGRAMMER

Test client/server applications using object oriented methodology, GUI tools, SOA, VB, Access 2000, ActiveX, ADO and Unix. Implement test plans, cases, scripts. Perform black and white box testing; installation and load testing.

BS degree in computer science, engineering discipline. 2 years experience.

Send resume to: Factor, a Division of WR Hess Company Attention: Lana Morgan, PO Drawer G, Chickasha, OK 73023

Computer Systems Engineer-IBM Storage Systems sought by technology consulting & sales company in Englewood, CO to work with data processing & project managers to obtain information on limitations & capabilities of existing system & capabilities required to data processing projects & projected workload. Perform detailed tape processing workload analysis, including both current & projected workloads. Develop system design to meet current & future needs. Analyze information to determine, recommend, & plan for type of computers & peripheral equipment, or modifications to existing equipment & system, which will provide capability for proposed project of workload, efficient operation, & effective use of allotted space. Provide pre-installation technical planning support for the installation of new system & modification of existing system. Train users, technical support staff, & technical managers in the use of the new or modified equipment, procedures, software tools, & practices. Monitor functioning of new equipment to ensure system operation conforms with specifications. Requires Bachelor's or foreign equivalent in Electrical Engineering; 2 yrs experience performing the core duties described above. \$100,000/yr; M-F; 8am-5pm. Respond by resume to James Shimada, CO Dept of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202, & refer to Job Order No. JL1118044.

Software Engineer sought by computer software development company in Englewood, CO, to work in Englewood & other unanticipated job sites in the U.S., to, working with SAP R2 & R3 systems, assess the business requirements of clients through a feasibility study, then implement, analyze, design, re-engineer & customize business & software programs to fit the needs of respective clients, using ABAP programming language. Provide training & documentation on SAP R3 adaptive products. Provide SAP system support, including troubleshooting & assisting development team to ensure that employer's proprietary products will enable non-SAP & SAP systems to communicate. Create custom solutions using intermediate documents (IDOC) & business application programming interface (BAPI). System administrator for multiple SAP development instances under ORACLE database. Requires Bachelor's, or foreign degree equivalent, in Computer Science or related field (including Chemical Engineering); 3 yrs experience as a software engineer using SAP R3 & R2 systems; Working knowledge of ABAP, IDOC, & BAPI. \$90,500/yr; M-F; 8am-5pm. Respond by resume to James Shimada, CO Dept of Labor & Training, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202, & refer to Job Order No. JL 1117234.

SAP Consultant (multiple openings) to meet with & consult with clients to determine their system needs & desires; conduct business & system analysis to determine if existing system needs modification or implementation of new system; analyze s/ware requirements & h/ware needs; design system while using SAP, Oracle, Sybase, Visual Basic, SOL\*Plus, PL/SOL, JCL, Developer 2000 & Crystal Reports; provide implementation, system & unit testing procedures; Reqs. Master's in Comp. Sci., Comp. Engg., Comp. Info. Systems, Comp. Apps., Electrical or Electronics Engg. or Math or its foreign educ equiv plus 3 yrs exp in job offered or 3 yrs related exp as Sr. S/ware Engr., Trainee Engr. or Computer Instructor. Will accept a Bachelor's degree or foreign equiv followed by at least 5 yrs progressive exp in specialty in lieu of req'd educ & exp. Related exp must include 2 yrs of system analysis, development & using Developer 2000, Visual Basic & Oracle; \$78,805/yr, 40hrs/wk, OT as req'd, 8a-5p. Applicants must show proof of legal authority to work in U.S. Send 2 resumes & cover letter (no calls) to Illinois Dept. of Employment Security, 401 S. State St. - 7 North, Chicago, IL 60605, Attn: Lydia Clarke, Ref. #V-IL25142-E "Employer Paid Ad"

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TX 76013.

Systems Analysts-- The Amdocs Group is looking for Systems Analysts to manage existing telecommunications software systems & develop new programming. Req'd.: Bach. Deg. in Comp. Sci., Math, Eng'g. or a related discipline. Must have exp. w/ C/C++, SQL & Ingres through education or employment. Position can be performed anywhere in U.S. Employer will supply technical equipment. Send resume to: The Amdocs Group, 2109 Fox Drive, Champaign, IL 61820, Att: A. Skalski.

Senior Device Technology Engineer

Advanced Micro Devices seeks

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to work on technology reliability

issues in advanced technology

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Place, PO Box 3453, MS 935,

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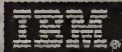
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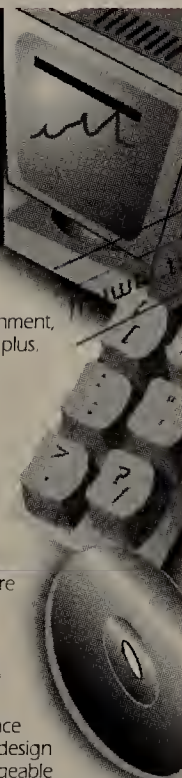
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**Some of the most savvy information technology in the world surrounds the energy, oil and gas, and insurance industries. That's exactly where you'll find a giant amount of opportunity in Texas. While Dallas and Austin have long shared the reputation as IT strongholds, other cities join the mix — Houston and San Antonio among them. Coupled with the fast-paced breakthroughs in IT, the state offers quality ongoing education through University of Texas-Austin and Texas A&M. It all makes for career opportunities the size of well ... Texas.**

# IT Careers in Texas

## Enron Net Works Houston, TX

The energy and utilities giant, Enron Corp, formed a separate commercial venture — Enron Net Works — just over a year ago. Its mission: commercialize and leverage the company's transaction-based and e-business platforms within the energy and commodity industries. "We provide services as far as operational and application service provision to companies," explains Philippe Bibi, president and CEO of Enron Net Works and chief technology officer for Enron Corp.

In less than five years, Enron has become a worldwide player in the energy market, offering utility power and exchange. The transaction support role for Enron Net Works is also expanding to the company's new businesses — forest products, freight and steel. "We're building a number of new transaction-based systems that leverage off some of the building blocks we developed," says Bibi. "The essence of the commodities market is a bit different, so we are creating new solutions from the logistics and entry management perspectives.

"Quite frankly, it's nice for an IT professional to come in and look at green field projects in development versus patching code," Bibi adds. In 2000, this challenge attracted more than 550 new employees. Among the successful hiring programs is Enron Net Work's College Graduate Recruiting Program. New college graduates enter a two-year program in which they rotate to new opportunities every year, crossing Enron companies and getting a chance to experience the varied technologies used.

Bibi says successful candidates tend to have degrees in electrical engineering or computer science. "We also are looking for people who have a good understanding of how this business works," he says. "Our development model places traders, accountants, operational employees and the IT staff on teams, so interactive skills and the ability to learn the business quickly are important. Our top performers tend to be fully conversant in the business, not just in technology.

"In this market, we are by far leading the pack in our IT reputation," Bibi notes. "It's a network of sophisticated infrastructure and solutions. If you want to learn and grow, you will be in an environment that is a leader. From a business perspective, we are on par with Wall Street giants in terms of our trading capability."

## USAA San Antonio, TX

A little over eight decades ago, USAA was formed by a group of military officers to provide insurance that targets the unique needs of military officers. Today, the San Antonio-based corporation has grown to offer full-service banking, credit, investment and financial planning services to go along with its highly reputed insurance.

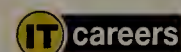
Of USAA's 4.6 million members, fully 1.2 million of them clicked in to the company's new e-commerce capabilities in the past year. In addition to the well-known use of database management to better serve customers, USAA's expansion in technology includes customer-service centers using call-center technology and leading-edge work in voice-over-web. "IT is the backbone of the business," says Bob Morrison, director of strategic staffing for the IT organization. "We create and maintain custom programs for investment management, the federal savings bank and property casualty. Technology runs along the breadth of these very strong businesses."

USAA is leveraging its e-commerce capability as it benefits members and the businesses. "There's a combination of customization and implementation going on," says Morrison, who notes that the USAA e-commerce group has won awards for its site. In addition to concentrating on the back-end of the systems, USAA's IT experts also continuously improve the interface with members by testing the systems in a lab on site at the San Antonio campus.

IT professionals at USAA are involved in development, networking, architecture design, consulting, security analysis and development, database management and system design. The company uses client/server and mainframe technology. "We believe this breadth of technology makes us an attractive technology challenge," Morrison adds. While he is recruiting individuals with technological expertise in these areas, he says that the "fit" is critical at USAA. "We want people who have experience and who have leadership capability, the things that indicate your character and well roundedness as an individual," he adds.

"We are hiring individuals for the long-term, not just for a job," Morrison says. "You'll grow through the business opportunities but also through the programs we offer to you." *Training Magazine* rates USAA among its "Top 50 Companies in Training and Development."

In addition to the traditional benefits, USAA's San Antonio campus is a self-contained service center for employees, offering a medical clinic, health and recreation facilities, dry cleaners and florist, as well as a dinner take-out service. "We don't just talk about being employee-centric, we act on it. Our IT organization enjoys a four-day work week. We want you to have a life/work balance. We believe that if we invest in our employees, we are better able to serve our members." This philosophy has placed USAA on the *Fortune* magazine list of "100 Best Companies to Work for in America" every year since the listing began.



**For more job opportunities with firms in Texas, turn to the pages of ITcareers.**

- If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or [janis\\_crowley@itcareers.net](mailto:janis_crowley@itcareers.net).
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# IT Careers in Financial Services

The methods people can use to manage their business and personal finances have literally exploded in the past 24 months due to the use of the Internet and other technologies. The challenge for the coming 12 months is just as great – for financial services companies to position themselves technologically to ride the crest of business possibilities.

## The Principal Financial Group Retirement and Benefit Services Des Moines, IA

Every year the Principal Financial Group pours more than \$325 million into its information technology capability. It's critical to the company, which provides insurance, residential mortgage, banking, investment and retirement solutions to its members. The Retirement and Benefit Services organization provides services to more than 2.2 million defined-contribution members and their companies.

Randy Nyberg, IT director of retirement and investor services at The Principal, says the retirement and benefit services portion of the business makes up 70 percent of its revenues. "We have about 1,500 developers and technical staff," says Nyberg. "Many of those folks are

co-located in the business areas, but there is also a core organization that supports the company's infrastructure and technology."

More than five million visitors visit the Principal.com site annually, including more than 1.5 million visits to the retirement service center. "A big part of our business is defined-contribution retirement plans. You as a member may want to change your investment elections, and a big piece of our technology allows you to select your own investment direction, learn more about options and then make decisions online," says Nyberg.

To link with customer companies, The Principal uses Direct Connect – employers log in to contribute their portion of funds to members' accounts, manage the overall plan and add members.

"We have ambitious goals to e-enable this organization, which has locations spanning the globe," Nyberg adds. "From a client perspective, it's important that we continuously upgrade and develop applications that reach our clients and improve that relationship."

The company is in need of people to fill positions from mainframe support and development to web development, infrastructure design and network experts. "We hire technical people who want to work on systems and infrastructure, application development within our business units," says Louise Crall, human resources generalist. "This is an IBM environment. We also consider experience that demonstrates your leadership. I want applicants who can show me they have accomplished results, who have business skills and knowledge."

The Principal plans to hire 100 additional people for the IT

area in 2001. "It's a challenging and exciting environment," says Nyberg. "You will see things here that you won't be able to see or experience elsewhere. At The Principal we view technology as a strategic advantage so our IT people are empowered leaders. You will have tremendous responsibility to deliver results and will be given the opportunity to do so. And, you'll be joining a team that has been very successful and is doing well globally."

## VISA USA San Mateo, CA

"For VISA, the challenge is looking at all the techniques and technologies, of all the possibilities, and then deciding what the most viable alternatives are from a business sense," says Karen Ugurbil, vice president of new systems initiatives for VISA.

The company offers IT challenges in research and development, operations, development for mainframe computing, new technology computing, web and Internet, as well as Intranet development. "We operate four major worldwide IT centers – two here in the United States, one in Japan and one in England," Ugurbil says. Currently, the financial services company is building a TCP/IP network that will be fail-safe and built to handle the growing transaction volume VISA handles every day – about 5,000 transactions per second right now. The company is also renewing its core systems to operate on open architectures.

The company recently began issuing chip cards in the United States. "Getting at the base of the payment infrastructure for chip cards and the network structure that is required provides a tremendous technological challenge," Ugurbil says. "We're now exploring how to use the chip to add more capabilities to that card. It's an entirely new area."

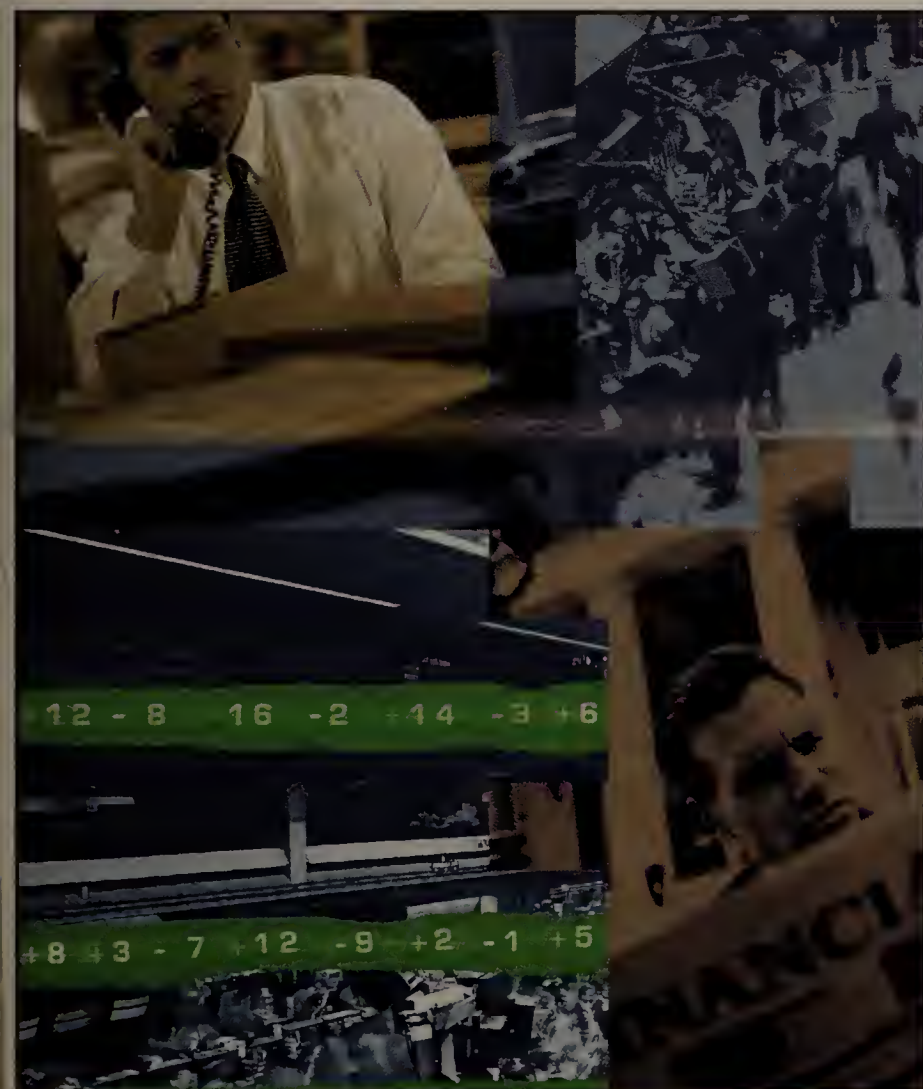
"The purpose of my specific group is to look at the convergence of new technologies along with what is going on in our business world, then recommend new initiatives and ideas based on thorough analysis and architectural reference implementation," she says.

"There is tremendous opportunity to work with fascinating research and technologies, pushing the limits of what devices can do," says Ugurbil. "There's also the opportunity for advancement and to build a solid career. VISA is definitely a place to have your intellect and creativity valued and put to use."

In addition to IT positions, Visa has openings in finance, brand marketing, sales, legal and eVisa.

For more job opportunities with financial services firms, turn to the pages of ITcareers.

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Debbie Lovell, National Sales Operations Manager  
Internet: [clasker,dlovell@nww.com](mailto:clasker,dlovell@nww.com)  
(508) 460-3333/FAX: (508) 460-1237

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Elisa Della Rocco, Senior District Manager  
Terry Sanders, Account Executive  
Aimee Jacobs, Sales Assistant  
Internet: [tdavis,elisas,tsanders,ajacobs@nww.com](mailto:tdavis,elisas,tsanders,ajacobs@nww.com)  
(201) 587-0090/FAX: (201) 712-9786

### NORTHEAST

Donna Pomponi, Regional Sales Manager  
Kathryn Zinn, District Manager  
John Mahoney, Account Executive  
Caitlin Horgan, Sales Assistant  
Internet: [dpomponi,kzinn,jmahoney,chorgan@nww.com](mailto:dpomponi,kzinn,jmahoney,chorgan@nww.com)  
(508) 460-3333/FAX: (508) 460-1237

### MID-ATLANTIC

Jacqui DiBianca, Regional Sales Manager  
Internet: [jdibian@nww.com](mailto:jdibian@nww.com)  
(610) 971-1530/FAX: (610) 975-0837

### MIDWEST/MARYLAND

Eric Danetz, Senior District Manager  
Aimee Jacobs, Sales Assistant  
Internet: [edanetz,ajacobs@nww.com](mailto:edanetz,ajacobs@nww.com)  
(201) 587-0090/FAX: (201) 712-9786

### CENTRAL

Dan Gentile, Midwest Regional Director  
Gracie Vela, Sales Assistant  
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(512) 249-2200/FAX: (512) 249-2202

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(650) 577-2700/FAX: (650) 341-6183

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Carol Stiglic, Regional Sales Manager  
Karen Weiss, Regional Sales Manager  
Internet: [cstiglic,kweiss@nww.com](mailto:cstiglic,kweiss@nww.com)  
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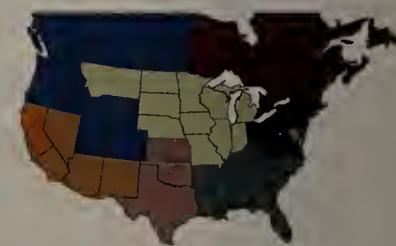
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Don Seay, Regional Sales Manager  
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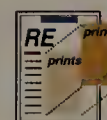


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**.Net,**  
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piece of code the company writes, and that not a single product at Microsoft will go untouched by .Net. Microsoft is committing \$2 billion through 2003 to help developers build .Net services.

The key for such integration is XML and its derivatives, which will be used to create standard application programming interfaces and so-called Web Services — chunks of reusable code.

The idealistic conclusion is that Microsoft is embracing standards for interoperability across servers, development languages, applications and devices. But critics fear .Net will evolve into another “embrace-and-extend” ploy through which Microsoft tweaks standards to its own liking.

“Microsoft is shooting for the same degree of dominance in Web computing that it had in the client/server model,” warns Jamie Lewis, president of The Burton Group.

Today, what’s of use in .Net is mostly aimed at Microsoft’s legion of developers. These developers are relying on XML and its offspring, the Simple Object Access Protocol (SOAP), an emerging standard for sending messages across the Internet that activate programs or applications regardless of their underlying infrastructure. Also useful are Universal Description, Discovery and Integration — a direc-

## WHAT YOU GET IN .NET

**W**ant to dissect Microsoft’s .Net? Well, good luck, but there is a place to start.

What is commonly referred to by Microsoft as its “.Net vision” falls into four categories — at least for now. They are:

- .Net Framework and Visual Studio.Net

The framework is a set of programming interfaces at the heart of .Net. It is the execution environment for .Net applications and handles many common programming tasks regardless of programming language. Visual Studio.Net is a suite of programming tools that supports multiple languages, including Microsoft’s new C#.

- Web services

A core set of Internet-based applica-

tions, such as file storage, preference management and calendars. HailStorm, which includes authentication and instant messaging, is the first set of such applications. Others will come from developers, but all are intended to be building blocks that can be incorporated into broader .Net applications.

- .Net enterprise servers

Eight servers that create a platform for building and deploying Web services. Windows 2000 is the foundation, but it won’t likely morph into Windows.Net until 2003, with such key ingredients as voice recognition. Other important servers are SQL Server for housing XML data; Application Center to support Web server load balancing; BizTalk for XML translation and building business workflows; Host Inte-

gration Server for connection to mainframes; and Mobile Information Server, a gateway to applications for mobile devices.

- Smart devices

These offerings, all in their infancy, include wireless Pocket PCs, phones with Microsoft’s Stinger technology and the newly unveiled Tablet PC. Microsoft provides the software and other vendors the hardware.

The “smart” in smart devices refers to their ability to take on some of the processing power of .Net applications and support work in offline mode. It also means the devices know you, other devices, the network and its constraints, and how to act on information.

— John Fontana

tory of companies and their XML interfaces — and Web Services Description Language, which describes what a piece of application code can do.

Companies are using the standards to create common interfaces that integrate unlike corporate systems. This fall, Microsoft hopes to make that exercise easier with the release of its Visual Studio.Net development tools and .Net Framework, programming interfaces that support multiple languages. Microsoft also created a programming language called C# that it submitted to the European Computer Manufac-

turers Association for consideration as a standard.

But today, to most companies .Net means using XML and SOAP to let systems talk to one another and share data — a goal that by no means defines just .Net. After all, Hewlett-Packard, IBM, Novell and Sun are among other vendors using the same standards for their own strategies similar to .Net.

“If the .Net computing model is based on XML and SOAP, the whole industry is going that way. If you want to, you can cater to Microsoft and call it .Net,” says Dwight Davis, an analyst with Summit Strategies.

“Microsoft hasn’t defined what it takes to be a .Net application, a .Net product.”

But some enterprise customers are creating their own definitions.

Dollar Rent-A-Car’s Osbourne used SOAP for what he calls a .Net Web Service to create standard interfaces so Dollar’s business partners could tap into the company’s car reservation system. He also is readying a pilot using Microsoft’s BizTalk Server to translate electronic data interchange transactions from travel agents for car rentals.

Dollar used Microsoft’s SOAP Toolkit 2.0, which is nearing release (1.0 went out in December) to create an interface that lets Southwest Airlines’ Unix system easily tap into Dollar’s reservation system, which runs on VMS and Windows 2000 (see graphic). The interface, which is in final testing, eliminated the need to hard-code a communication channel between the two systems.

“We could have hard-wired it, but that is low-level and we wanted something at a higher level. SOAP created a generic front end. Anything that can talk to that front end can talk to our reservation system,” Osbourne says.

And generic means reusable.

“We designed the SOAP interface for Southwest, but we will use it for our Web site. Our Palm application already uses it, and we’re building a Pocket PC application,” Osbourne says. “It took us three days to build the prototype for the

reservation system. It was amazingly simple, almost too good to be true.”

It’s a first-step application, but exactly the kind of enterprise network application Microsoft has in mind for companies buying into .Net.

“What business people can do is integration of applications and commerce over the Internet,” says Barry Goffe, group manager for .Net enterprise solutions. “.Net will allow enterprises to build a reusable integration layer [with XML] that they could not build before.”

Another .Net adopter is Solidworks, which makes Windows-based CAD software. The company used SOAP to develop 20 APIs for its hosted Web Service called 3-D PartStream.Net.

But the company uses a familiar back end that would be hard to describe as .Net.

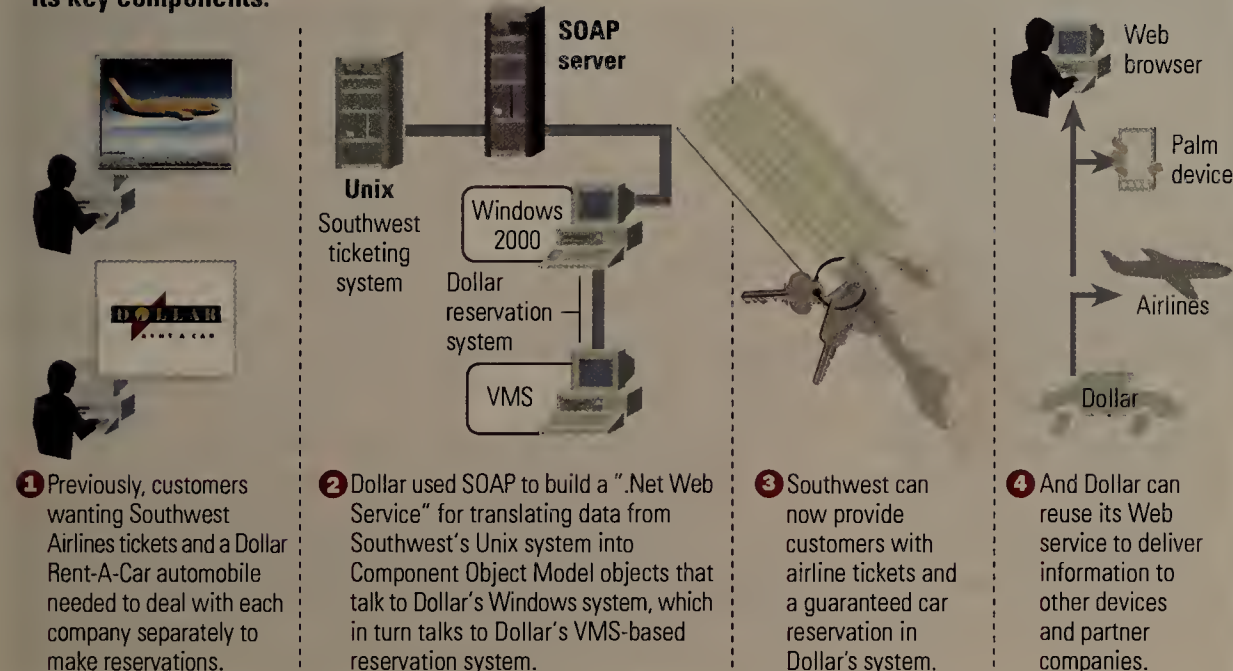
It consists mostly of Microsoft’s SQL Server, Internet Information Server and Win 2000 products. The company also uses Microsoft’s Application Center 2000, one of eight .Net Enterprise Servers, to load balance its Web site.

The infrastructure hosts the Solidworks Web Service, which delivers three-dimensional models to online catalog sites. The SOAP interfaces let users download, configure on the fly and translate models from any format for insertion into any online catalog.

“The most intensive part is on the development side,” says See .Net, page 76

### .Net in action

**Dollar Rent-A-Car’s use of the Simple Object Access Protocol to improve its reservation system sheds light on how companies might buy into Microsoft’s .Net strategy, which counts SOAP among its key components.**





continued from page 75

Mark Digregorio, partner and technical manager. "To set up with partners, we have to ask if they understand XML and SOAP."

### The infrastructure

So what's left to figure out is how the infrastructure becomes .Net and where Microsoft may put its hooks into IT executives.

Microsoft has released a set of eight .Net Enterprise Servers. Many of them, including Win 2000, are .Net in name only and still a version or two away from truly supporting .Net.

The .Net strategy is likely to have little impact on network infrastructure in the short term outside of upgrades to Win 2000, which is required to run any .Net server.

But wrapping them together with a management platform is a .Net issue Microsoft has yet to solve. The company is developing a platform, which includes upgrades to the operating system, System Management Server and the forthcoming Microsoft Operations Manager, but it won't be ready until next year.

Other Microsoft software, such as Exchange and SQL Server, are on the way to being combined into one repository to support .Net and XML. And new servers such as XML translation engine BizTalk Server 2000, Web server load balancer Application Center 2000 and mainframe middleware Host Integration Server 2000 will bring additional capabilities.

On the client side, there is technology such as Microsoft's Stinger software to extend .Net to mobile devices. The soon-to-be-released Windows XP desktop operating system is starting to incorporate .Net technology, including the recently released HailStorm. The HailStorm Web Services are authentication and instant messaging services available over the Web to consumers.

### Drawing criticism

HailStorm also has become a lightning rod for critics who say the technology is the beginning of where Microsoft will lock users into .Net.

"Microsoft is injecting its own services between corporate Web sites and their customers," says Dana Gardner, an

analyst with Aberdeen Group. "The question is, If I run a Web site, do I want Microsoft to be between me and my customers?"

With HailStorm's Passport service, a free offering available on MSN, Microsoft could control authentication services and user information for hundreds of thousands of Web sites. Nearly 160 million Passport IDs are in use and 10 million are being issued daily.

Sources say Microsoft is toying with the idea of collecting micropayments on those services, therefore guaranteeing, regardless of platform or client, that it gets a cut on millions of authentications made to Web sites daily.

"Microsoft couches .Net in the words of standards, but the devil is in the details," says Dan Kusnetzky, an analyst with IDC.

"Looking at XML and SOAP and how they will be incorporated into development tools, the [operating system], serverware and middleware gives me concern that Microsoft is building a fortress one component at a time," he adds.

Kusnetzky says it is a "clever strategy because business people hear all the right words — open, interoperable, compatibility — but a lot of the details are not yet specified and they can still be spun in Microsoft's favor to where others have to jump over high hurdles to participate."

It's a strategy similar to those Microsoft has put forth in the past for file formats, APIs and development technologies such as Component Object Model and Distributed COM. Such strategies were what got Microsoft into trouble with the government in recent years.

Microsoft's .Net plan shows signs of being different with its XML-based interoperability thrust, but the strategy could become entangled in a Web of Microsoft's own making.

If that starts to happen, IT executives who keep a critical eye on Microsoft now may be able to head the company off this time. ■

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# Microsoft adds security tools

Features being added to Whistler to control executables and support PKI.

BY JOHN FONTANA

Microsoft is looking to beef up security in the next version of Windows 2000 and, in the process, shed its reputation as poster child for the spread of malicious code.

Microsoft is adding controls to let administrators set policies that block the execution of downloaded code unless it is from a trusted source identified by corporate IT. The trusted sources are recognized as part of policies that are stored in Active Directory and automatically distributed to servers and desktops.

The company also is adding features to ease the rollout of certificates that help manage public-key infrastructure (PKI), a secure method for exchanging data. There also will be a new

■ **"I don't think we have anything to apologize for, and we are committed to doing this well."**

Steve Lipner, manager of Security Response Center, Microsoft

personal firewall in Windows XP, the next version of the desktop operating system.

IT executives are hoping the moves are a step toward more secure systems, but critics are calling them Band-Aids on a flawed architecture.

Windows XP and the next generation of Windows 2000 servers, code-named Whistler, will come with a policy engine called Software Restriction Policies that blocks mobile code from being executed by the user. Mobile code is executable code that is delivered to a desktop or server through the Internet or e-mail.

"I'm glad to see Microsoft acting instead of reacting," says Jeff Allred, manager of network services for the Duke University Cancer Center. Allred is keen on

## Building in security

Microsoft is adding a host of new security features to the Whistler server, the next version of Windows 2000, and Windows XP, the new desktop OS.

Features	Description
Software Restriction Policies	Blocks malicious mobile code.
PKI enhancements	Ease distribution of certificates on smart cards.
Security Configuration Tool	Aids in secure setup of Internet Information Server.
Internet Connection Firewall	Personal desktop firewall.
Hotfix Checking Tool	Checks if patches and associated files are up to date.

security issues because he is facing regulations under the Health Insurance Portability & Accountability Act of 1996, which sets standards for creating, storing and transferring medical-related data.

"I get a little comfort knowing controls like these are coming, because I will need them at some point," Allred says. But he also notes that he has dodged most of the problems because his mail system doesn't use Microsoft Outlook.

Outlook has been at the center of high-profile virus attacks in the past year. Those incidents have been a driving force behind another Microsoft push to show a dedication to security. This one is called "the war on hostile code."

But critics say the newest measures are a patchwork. "Anything they do in the security area around malicious code is just sticking something over the top of their systems so they

don't bleed as quickly," says Frank Prince, an analyst for Forrester Research. Prince says the Office suite, which includes Outlook, has become its own distributed operating system, with executable code in the applications, but without the underlying security and management mechanisms of a true operating system.

Microsoft officials say that ensuring secure systems takes diligence in the product development process. "The challenge in the real world is to build software that is secure but that customers can buy and use," says Steve Lipner, manager of Microsoft's Security Response Center. "I don't think we have anything to apologize for, and we are committed to doing this well."

Microsoft internally is launching Secure Windows Initiative, which will bring specific training, tools, process controls and testing to the Windows Development Group. ■

Network World, 118 Turnpike Road, Southborough, MA 01772-9108, (508) 460-3333.

Periodicals postage paid at Southborough, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. Network World (ISSN 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 118 Turnpike Road, Southborough, MA 01772-9108.

Network World is distributed free of charge in the U.S. to qualified management or professionals.

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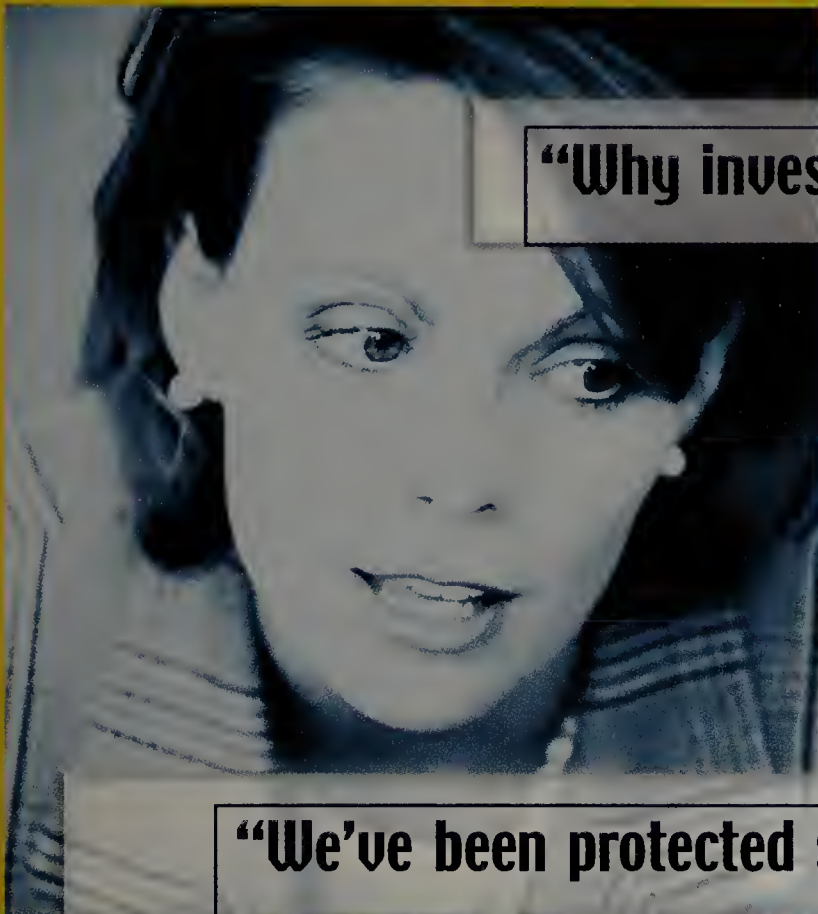


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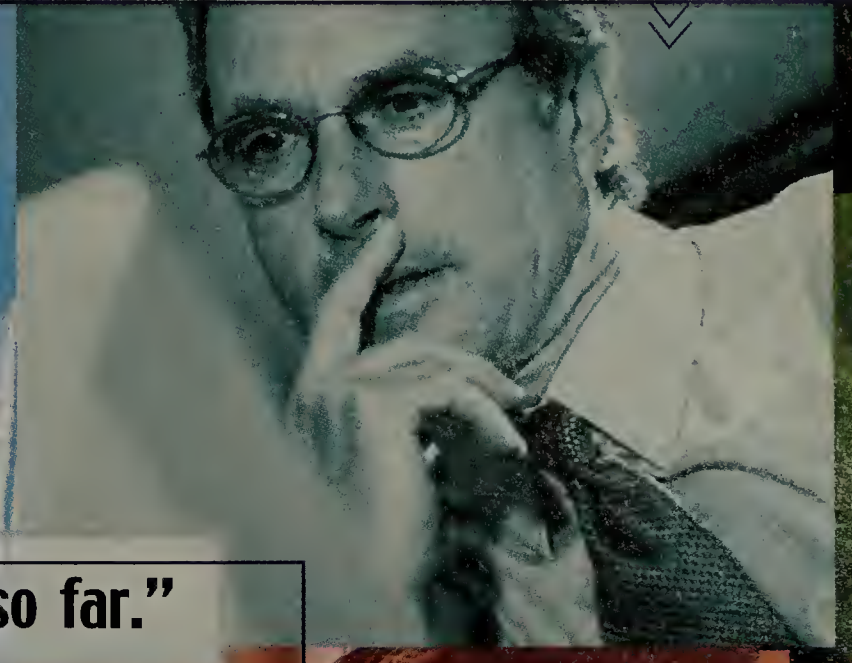
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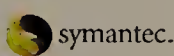
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## Relentless illogical spam

*"A well-adjusted person using a functional keyboard can hit the Delete key much faster than he can walk to his mailbox and back carrying an armload of dead trees and nonbiodegradable inks and plastics, which he will use to infect the environment by tossing them out with the trash. As we all know, spam is 100% biodegradable. It never hurt a tree, and can be recycled with a key-stroke. Yet virtually none of us go to the trouble to phone Reader's Digest and demand they stop sending bulk mail, nor write nasty letters to their upstream demanding they be put out of business immediately.*

*I started the previous paragraph with "well-adjusted" to make a point. I firmly believe that anyone who can be enraged to action by the receipt of an innocuous piece of advertising e-mail is a bit "off" emotionally.*

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*Thank GOD companies use e-mail and buy fewer billboards. Thank GOD they send nonpolluting bits around the 'Net instead of environmental poison through the mail. Get over it, I say to the torch-carrying mob. Wake up and realize it's NOTHING. Grow up and get over it, and move on to something that's actually important."*

— Rob Cosgrove, CEO, Quantum Tech, justifying his company's spamming with relentless logic. Sort of.

I received four messages from Cosgrove's company on Monday (one to each of my Network World feedback addresses) and they were classic spam: No company or sender's names, sent from

a noncompany mail server, and with a Yahoo reply address. But responding to the message gained me a reply that was a classically cheesy sales pitch and link to a real Web site, and from there to a telephone number, to a conversation with Cosgrove, to the above e-mail follow-up.

In our telephone conversation, Cosgrove told me that out of each batch of 50,000 e-mail messages his company gets about 70 responses and about 30 sales. Cosgrove's company is selling remote back-up software — it backs up your machines across the Internet — as a home business! (Can you say "contingent liability"?)

Cosgrove pointed out that the sell-through makes the cost of sales negligible. And he's right — it is negligible unless you consider having 49,930 people really irritated with you to have a cost.

I asked my friend Jim Sterne — my favorite marketing guru — to comment and he noted that "It is surprising just how logical the pro-spammers can sound." Sterne also pointed out that with what he calls a "scorched earth" marketing strategy like this, the damage to the brand is enormous and unrecoverable. (He also sent me an amusing exchange he had with a well-known company about spam they sent him — see [www.targeting.com/iwSpam.html](http://www.targeting.com/iwSpam.html)).

In my conversation with Cosgrove, I pointed out that if everyone started to market the way he's marketing, spam would be all there is — then we're likely to get legislation that may well be even more obnoxious than the spam. Sterne pointed out that there are 12 million businesses in the U.S. If each sent out just one spam to you per year, that would work out to 1,370 per hour!

I'm going to stop writing about spam — at least for a week — because it is, indeed, a losing battle. Spam is here to stay and logic has nothing to do with it.

*Gloomy predictions to [nwcoluun@gibbs.com](mailto:nwcoluun@gibbs.com) and leads on spammers to [mailabuse.org](http://mailabuse.org) (see <http://mail-abuse.org/rbl/notifyfaq.html>).*



MARK  
GIBBS

The latest on the Internet industry

**You'll have to pardon BAMnet founder Michael Meighan** for giggling every time another deceased DSL provider leaves thousands without Internet access. Never mind a silver lining, Meighan's prospecting for gold in this dark cloud.

BAMnet offers at-the-ready back-up Internet access at [www.bamnet.net](http://www.bamnet.net). Customers connect to the 'Net using BAMnet's dial-up number and PIN — 1-888-822-6162, 2154408382. They are not charged monthly fees, but rather 6.5 cents per minute, with connections lasting less than 30 seconds being free. Charges appear on your local phone bill.

The New Jersey company had been targeting rural Internet users who already pay local toll charges on top of their monthly ISP fees with an opportunity to avoid the latter expense. But the back-up function has emerged as more fertile territory.

"Lately, the No. 1 reason for high back-up usage has been a business coming in on Monday and finding its DSL provider closed up over the weekend," Meighan says. "Unusually high usage from users warrants our support staff to call them to make sure they understand the 6.5-cent toll charge, and that's how we've been hearing about their DSL stories. These folks have spent as much as \$100 [on BAMnet] in a single week."

Truth is most of us could use such a service now and then, given the frequency of ISP service interruptions.

There are free ISP services one can turn to in a pinch, but they generally insist you fork over everything but a DNA sample in terms of personal information, and/or they blanket your screen with advertising. BAMnet does neither; just that per-minute charge that Meighan says customers are more than willing to pay when the alternative is going without e-mail.

BAMnet doesn't have much of a marketing budget to tout this back-up ISP angle, he acknowledges, which means it has a steep uphill climb.

**McKinsey & Co. estimates** that one out of four items bought online will be returned.

That figure may seem high to some of you, but I'm thinking it might be low, at least based on the steady flow of online purchases into and right back out of the Buzz household. Being a guy, I don't return anything for any reason whatsoever. Being a woman, Mrs. Buzz... well, let's bail out of this thought before the hole gets dug any deeper.

Returns are big, whatever the exact percentage, and that means a big business opportunity exists for Returns Online, a start-up with headquarters in Mercer Island, Wash., and a package-processing facility outside Atlanta. Returns Online is a business-to-business company that provides all the logistical support needed to fetch, ship, unpack, process and dispose of returned goods. Merchants use technology from Returns Online to take return instructions from online shoppers and issue immediate electronic refunds. A partnership with the U.S. Postal Service gives Returns Online instant cachet and a ready delivery fleet.

**CEO Shannon Hauser** claims his company can save merchants 30% to 50% of the costs associated with processing returned items, and also provide them with a wealth of information about those returns that can help polish customer service.

Returns are a nightmare for retailers. If Hauser's company can deliver, Returns Online will be a hit.

**Anyone who spent the weekend** wrestling with tax forms might get a chuckle out of a spoof "1040" making the rounds: "Income Tax Return for Recently Laid-Off Dot-Com Employees."

OK, almost anyone.

Instructions include: "Whichever line is greater, line 8 or line 9, multiply by 40%. Then multiply the number of stock options (include pre-IPO splits) you were given by 4. Add these two numbers. This is your tax owed."

The parody is cruel, sophomoric and funny. Check it out at [www.thoughtpolice.com/bayboyz/1040.html](http://www.thoughtpolice.com/bayboyz/1040.html).

*It's not too late to file your comments. The address is [buzz@nww.com](mailto:buzz@nww.com).*



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# DATA STORAGE IS NO LONGER *THE SILENT PARTNER.*

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IT'S THE ONE SCREAMING FOR YOUR ATTENTION.



*fig. 1.1: Storage screaming for your attention (metaphor)*

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